

MOTOR AGE



DECEMBER 17, 1914—10 CENTS A COPY

HARRY GERHARD

BRISCOE

Today the Briscoe is the car of big demand, as we can readily prove to you.

The BRISCOE is the car that the medium sized car buyer looks up to with a hopeful prospect of possession.

Perhaps he is the owner of some good small car, but wants a more ambitious one for the coming season. For some time he has felt that he ought to be able to get a lot more value—more high grade features, more smartness, better riding quality; in a word, *more car* for his \$1000 or less; in fact—a BRISCOE.

On the other hand, a BRISCOE is pre-eminently the car that is going to attract the buyer accustomed to a big and more expensive car. Such a man needs mighty little saleswork. He is motor-wise, used to quick decisions on important matters, and will sell himself—if given a chance to look a BRISCOE over.

It is the converging of these two different public demands that makes the BRISCOE, at \$785, THE CAR OF BIG DEMAND—the *ideal car for every Owner-Driver.*

Are you likely to do better than by handling the car that pleases one large class by its supreme value, and another large class by the very moderate figure at which it is offered?

(Better get in touch with us AT ONCE.)

\$785⁰⁰

**COMPLETELY
EQUIPPED**



BRISCOE MOTOR COMPANY · JACKSON MICH



SAVE YOUR FORD and ride in comfort-

Tempered Steel Springs and High Quality Forged and Rolled Steel for the Other Parts Are Used in the Manufacture of C-C Shock Absorbers

There isn't a single cheap thing about C-C Shock Absorbers. The surprising lowness of their retail price is due purely to the fact that they are made and sold in enormous quantities. We couldn't buy better springs, we couldn't buy better cages, we couldn't put better work into the manufacture of the C-C Shock Absorber if we sold it for \$100 instead of \$8.

You have hesitated about buying shock absorbers for your Ford in the past because the price was too high—all out of proportion to the price of your car. Yet you knew that you ought to have them. You realized that proper shock absorption meant more comfort to you, lessened up-keep expense due to decreased tire, fuel and repair bills and increased life to your car. Now all this is possible for only \$8 and the C-C is the answer.

We have been successful manufacturers of metal specialties for over forty years. We have devoted five years of this to the shock absorption problem. We have supplied thousands of the world's highest priced and heaviest cars with the famous Coxajusto Shock Absorber. Therefore, we know that the C-C Shock Absorber is the proper Ford solution and do not hesitate to guarantee satisfaction or your money back to you. These are the only terms upon which we care to do business.

Go then to-day to your Ford dealer and have him attach a full set of four to your Ford while you wait.

8⁰⁰
for set
of four

COX BRASS MFG. CO.

Albany, New York

BRANCHES:

1777 Broadway
N. Y. City

2637 Michigan Ave.
Chicago, Ill.

4⁵⁰
for set
of two



What About Your Car's Ignition?

THE ignition question is a most serious one especially now that a desire may exist to skimp here and there to obtain a low selling price.

Ignition should not be grouped with the good enough class, too much depends upon it. If the system is made cheaply, it can't last; if it is designed improperly, the engine will be sluggish and inefficient; in either case there is trouble in store for the owner, and a forceful advertisement to hurt the future success of the maker.

The Bosch Magneto

because of its quality and excellent design is known as the most desirable ignition system. It is built to uphold a reputation, to measure up to a standard and consequently it costs just a little more than other ignition systems—but considering its ability to serve long and well, it is comparatively the cheapest system made.

*No car is too low priced to be good—
to be good it must serve well—to
serve well it must be Bosch-Equipt.*

Correspondence Invited.



Bosch Magneto Co., New York

214 West 46th Street :: :: New York
Chicago Detroit San Francisco Toronto

Over 250 Service Stations back up Bosch Users



Published by the
CLASS JOURNAL COMPANY
910 South Michigan Avenue
CHICAGO ILLINOIS

YEARLY SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....\$3.00
Canada and all Foreign Countries..... 5.00

All currency should be sent by registered mail.

Two weeks should be allowed for change of address to become effective, or for receipt of first copy on a new subscription.

In forwarding change of address, please give old and new address.

BEWARE OF SOLICITORS, OFFERING SUBSCRIPTIONS AT CUT RATES.

Volume XXVI

December 17, 1914

No. 25

C o n t e n t s

IN THE WAKE OF THE BLUE AND THE GRAY.....	5
Southern battlefields now mecca for motorists	
CHICAGO RALLIES HIGHWAY ENTHUSIASTS.....	10
Big good roads meeting now in session	
EDITORIAL	12
CHICAGO ANNOUNCES IT WILL HAVE BOARD SPEEDWAY.....	14
Plans made for 500-mile race on June 19—Track to be 2 miles and be ready by June 1	
RACING CARD FOR 1915 PROMISES DRIVERS RICH REWARD....	15
Advent of new speedways booms game—Possibility of purses totaling \$400,000	
CARLSON MAKES SENSATIONAL CLIMB.....	16
Maxwell driver goes up Mount Wilson in 29:01	
GATEWAY TO CALIFORNIA NO WINTER ROAD.....	17
Party investigates Tioga pass conditions	
REPORT ON EXPORTS AND IMPORTS FOR OCTOBER, 1914.....	18
United States government makes interesting deductions	
PREMIER TRUSTEE ORDERED TO CONTINUE THE BUSINESS.....	19
Creditors believe Indianapolis concern can be saved	
SUBMIT PLANS FOR BEAUTIFICATION OF LINCOLN HIGHWAY....	20
Committee receives designs from forestry and horticultural experts	
WASHINGTON PUTS \$13,000,000 INTO ITS HIGHWAYS.....	22
State accomplishes wonderful results in 2 years	
RENAULT BUILDS ARMORED CARS FOR THE FRENCH ARMY.....	26
Details of construction of fighting machines	
MOTOR CAR DEVELOPMENT.....	28
Description of Gray & Davis starting and lighting system, Willis-Knight, Oakland roadster and new Kissel six	
INDEX TO ADVERTISEMENTS.....	102

DEPARTMENTS

See America First.....	13	Coming Motor Events.....	40
Readers' Clearing House.....	34	Among Makers and Dealers....	41
Motor Car Repair Shop.....	38	Recent Incorporations.....	41
The Accessory Corner.....	39	Brief Business Announcements.	42
From the Four Winds.....	40	New Agencies Appointed.....	42

Following its usual practice, Motor Age will publish next week a review of the industry and the sport for 1914, reviving the memory of the motorists as to what has happened during the old year just coming to an end.



Deep, soft, richly tufted upholstery is one of the quality-marks of a desirable motorcar—a fair index to the integrity of the car's general mechanical construction.

A good car with passenger-fatiguing seating accommodations is a contradiction in terms. Look to the upholstery of the car you intend purchasing!

Over half the quality cars of motordom are upholstered with—

SULZBERGER'S STERILIZED CURLED HAIR

Automobile Upholstery De Luxe

—because of its unequalled durability and resiliency.

—because of its sanitary qualities.

—because in the long run it costs less than cheap substitutes.

Car Manufacturers: We are upholstery engineers. No matter what your requirements may be we can fill them. Samples of hair cheerfully furnished.

SULZBERGER & SONS CO.

Chicago  Illinois



REG. U. S. PAT. OFFICE

THE SPLITDORF ELECTRICAL COMPANY presents in their "Cunningham" Model "Six" a new type of water- and dirt-proof high-tension magneto whose range of spark advance extends over an arc of 70° and which is capable of producing flame sparks at the slowest engine speeds. It is constructed particularly for easy starting without the use of battery, auxiliary coils, or any external devices and conforms to the Society of Automobile Engineers' standards of measurement.

It is constructed so that there is practically no difference in the strength of spark when the break is in advanced or retarded position, the speed remaining the same. By this construction an advance of 70° is obtained which is essential for long-stroke, slow-speed, six-cylinder engines.

Insist upon SPLITDORF MAGNETO IGNITION—IT'S NECESSARY

SPLITDORF ELECTRICAL COMPANY

ATLANTA.....10-12 E. Harris St.	DAYTON.....427 East 3rd St.	NEWARK.....290 Halsey St.
BOSTON.....1112 Boylston St.	DETROIT.....972 Woodward Ave.	NEW YORK.....18-20 W. 63rd St.
CHICAGO.....64-72 E. 14th St.	KANSAS CITY.....1827 Grand Ave.	PHILADELPHIA.....210-12 N. 13th St.
CINCINNATI.....811 Race St.	LOS ANGELES.....1215 S. Hope St.	SAN FRANCISCO.....1028 Geary St.
DALLAS.....402 S. Ervay St.	MINNEAPOLIS.....34 S. 8th Street	SEATTLE.....1628 Broadway
LONDON	BUENOS AIRES	TORONTO

Factory: NEWARK, NEW JERSEY



The highest point on Lookout mountain, where the spectacular "battle above the clouds" was fought 51 years ago, and a panoramic view of the sinuous Tennessee river and the historic city of Chattanooga

In the Wake of the Blue and the Gray

Southern Battlefields Now Mecca for Motorists

by J. C. Burton

The echo of the mighty siege guns booming across the Atlantic and the tramp of the armed hosts of Europe have been heard in this country and martial deeds now appeal to the American mind. The American business man reads and talks of war. The American boy has asked Santa Claus to include soldiers in the Christmas allotment. The American motorist is planning to visit the historic scenes of battles fought a half-century ago when the forces of north and south were deadlocked in civil strife. Next to the Pacific coast, the south will be the favorite mecca for American motorists in 1915 and the battlefields south of the Mason and Dixon line will be the magnet that draws them. The government has converted six of the most famous battlefields into national military parks—Gettysburg, Antietam, Vicksburg, Shiloh, Chickamauga and Chattanooga. This article deals especially with the historic places in the vicinity of Chattanooga and Chickamauga park and outlines routes by which the northern motorist may reach these perpetual memorials to American valor.

IT was a crisp November morning. The aroma of pine needles and the faint incense from a distant campfire were in the air. Had it been spring or early summer, the slopes would have been purple with rhododendron and pink with southern laurel, but in the late autumn only the crimson of the bold and hardy sumac is seen scattered over the brown carpet of fallen leaves. Yet the mountain was not without color. Its sides were splashed with the red foliage of countless oaks, red foliage that ranged from violent scarlet to somber maroon, red

foliage that seemed redder than red against the green background of the pines.

The road over which we drove is a twisting, tortuous trail of many turns, a highway cut and blasted through rock. On one side is a precipitous drop with only the trees to break the fall. On the other side, rising tier upon tier, are jagged cliffs of sandstone, which, in their varied shades of redness, resemble the wonderful outcroppings of rock in the Grand Canyon of the Colorado.



Iowa monument in Rossville Gap, midway between Chattanooga and Chickamauga park



New York peace monument on highest point of Lookout mountain, erected by the Empire state at a cost of \$100,000 to commemorate the reunion of north and south.



Snodgrass hill in Chickamauga park where General Thomas made his famous stand and earned the sobriquet of "The Rock of Chickamauga." General Thomas made his headquarters in the house shown in the background

Here, a palisade recalls a trip along the Hudson; there, a ledge of rock juts out precariously over the road. It is a modern motor highway amid barbaric and primitive surroundings.

Piercing Clouds to Reach Crest

After 5 miles of continual climbing, we finally reached the summit and drove north to Lookout Point, the highest point on the 6-mile ridge of rock and forest. In our ascent, we had pierced a bank of rain-laden clouds and emerged from a disagreeable drizzle into glorious sunshine. Far,

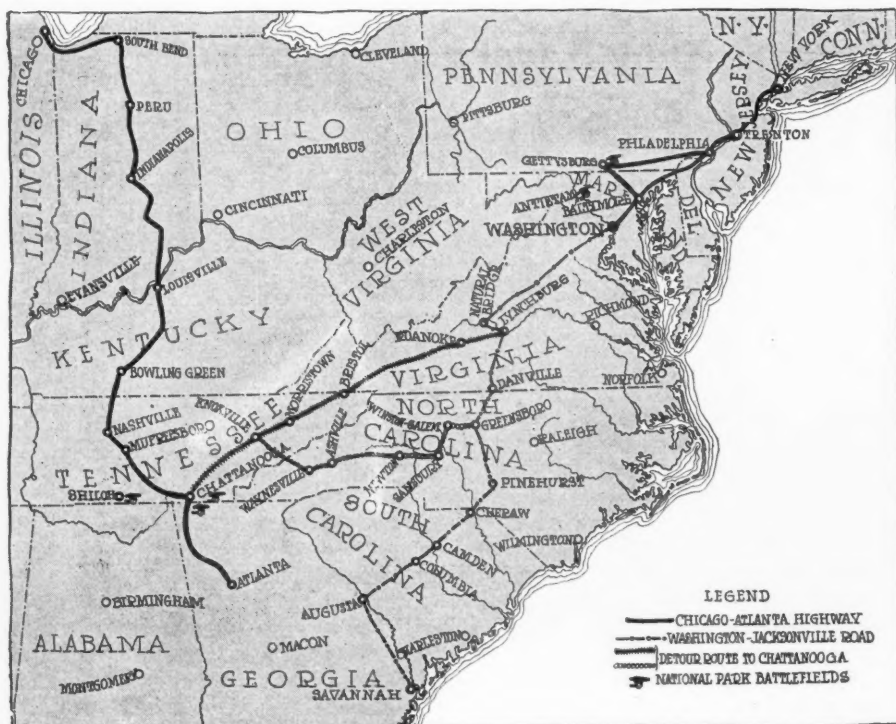
far down in the valley below us, the waters of the Tennessee, contortionist of rivers, gleamed like a silver thread. In its centuries of wanderings, this gypsy stream has described a huge and symmetrical S, as perfect as if the letter had been outlined on the green fields with a sign-painter's stencil, and cut a colossal foot, known as Moccasin Bend, in the fertile soil. From an altitude of over 2,000 feet, these phenomena of erosion appeared as if viewed through the wrong end of a pair of opera glasses. The city of Chattanooga,

cuddled in a protecting arm of the twisting, wiggling, sinuous river, seemed but a play town. A railroad train, skirting the base of the mountain, looked small enough to be hung on the slender branch of a Christmas tree.

Sherman's War Definition Verified

We stood upon historic ground. Fifty-one years before, almost to a day, this peak had been the scene of the most spectacular battle of the civil war, a battle waged above the clouds. We were on the crest of Lookout mountain, defended by Wathall and stormed by Hooker on the morning of November 24, 1863. The muzzled Confederate battery on the summit of the mountain has been silent for more than half a century, but 51 years ago it spoke with the voice of death as its shot tore through the ranks of the blue-clad troops, struggling up the steep slopes and through the dense forests under cover of the fog. Two hundred feet below, on a broad plateau, are evidences of the trenches from which the rifles of the Confederates rained down lead upon the men of Hooker, climbing, slipping, falling; yelling and cursing; pressing forward, a labored foot at a time, to reach the top and capture the natural stronghold. If you have any doubts about the correctness of Sherman's definition of war, you have only to stand upon Lookout mountain and imagine yourself a soldier in the assaulting corps to have such doubts completely and speedily dispelled.

The summit of Lookout mountain is ground hallowed by blood. Here Wathall's brigade, numbering not more than 2,000 men, threw off defeat for a day and night of tortures; here the 10,000 stalwarts of Hooker climbed and staggered to plant the stars and stripes on the peak of the rugged



Map showing two main north and south highways and detour routes to Chattanooga and the historic points in the vicinity of the Tennessee city

crest. During the battle the clouds, which at first enveloped the troops, passed away, disclosing the great mountain brilliantly illuminated in the dead of night by the fierce glare of musketry fire and exploding shells. At dawn on the second morning, the Confederates had retreated to Missionary Ridge, 6 miles to the east, and the slopes of Lookout mountain were strewn with the bodies of the dead.

*"When you're down in Tennessee
Stop at Chattanooga, stop at Chattanooga,"*

ran the chorus of a popular song which was shouted and flouted by the cabaret entertainers a year or so ago. It is good advice. A visit to Chattanooga will repay you for the trip with compound interest. There are scenic drives through the rugged Cumberland mountains—towering peaks to climb and the crests of high ridges to explore—that have a charm with which to hold the tourist from the north. There are historic spots—battlefields where troops fought above the clouds and where the blood of the slain dyed red the waters of the ponds and creeks—that recall to the patriot that terrible conflict of a half-century ago and send the blood to the heart with martial beat.

A Circle of Historic Places

For the motorist wishing to follow in the wake of the soldiers who wore the blue and the gray 50 years ago, Chattanooga is

an ideal base of operation. Situated near the intersection of the boundary lines of Tennessee, Georgia and Alabama, it is the center of a region where for 4 years the booming of cannon and the popping of rifles were continually heard. By placing the point of a compass at Chattanooga and describing a circle with a 200-mile radius, you have an area that includes those portions of the states of Tennessee, Georgia, Alabama and Kentucky where the most decisive battles in the campaign for the control of territory south of the Ohio river were fought, battles which in their results were as important as the multitudinous engagements waged in the vicinity of Richmond, the Confederate capital. Virginia, the stage on which the swords of McClellan and Grant, Lee and Jackson clanked and where the hoofs of Sheridan's charger pounded, alone can dispute this region's claim of being the theater in which the most crucial



New York monument on Wauhatchie battlefield at the base of Lookout mountain and disputed territory in the Chattanooga-Chickamauga campaign

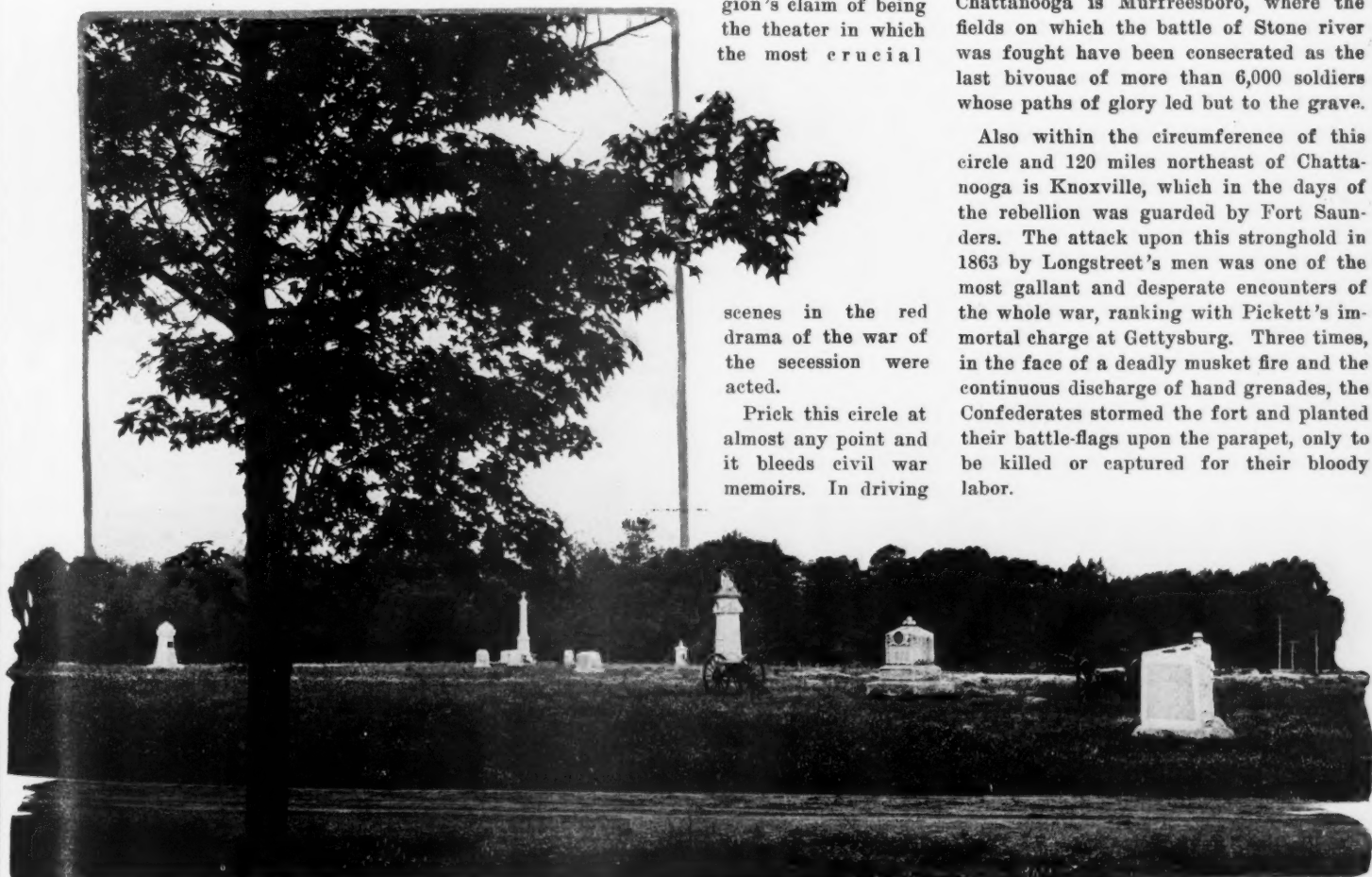
south to Atlanta, a distance of 125 miles, the motorist follows the route of Sherman's army through northern Georgia and passes through the historic towns of Ringgold and Dalton, where the retreating troops of Bragg made heroic but ineffectual attempts to check the advance of the blue-coated invaders and save Atlanta from firebrand and Savannah from capture.

One hundred and sixty miles west of Chattanooga, but fully 50 miles further by the circuitous trail through the mountains, is the battlefield of Shiloh, the scene of the greatest surprise attack of the internecine struggle and an abattoir of war that now is a national park of peace. On the road to Nashville—the home of two presidents, Andrew Jackson and James K. Polk—on the outskirts of which Hood's forces were scattered never to fight as a corps again, and 110 miles northwest of Chattanooga is Murfreesboro, where the fields on which the battle of Stone river was fought have been consecrated as the last bivouac of more than 6,000 soldiers whose paths of glory led but to the grave.

Also within the circumference of this circle and 120 miles northeast of Chattanooga is Knoxville, which in the days of the rebellion was guarded by Fort Saunders. The attack upon this stronghold in 1863 by Longstreet's men was one of the most gallant and desperate encounters of the whole war, ranking with Pickett's immortal charge at Gettysburg. Three times, in the face of a deadly musket fire and the continuous discharge of hand grenades, the Confederates stormed the fort and planted their battle-flags upon the parapet, only to be killed or captured for their bloody labor.

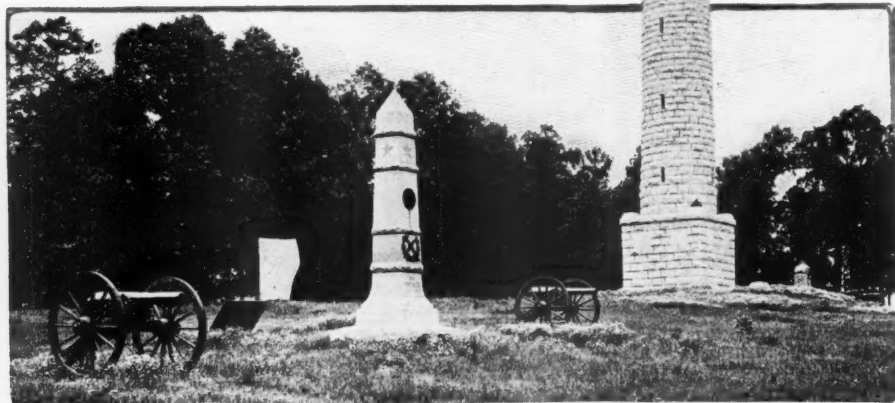
scenes in the red drama of the war of the secession were acted.

Prick this circle at almost any point and it bleeds civil war memoirs. In driving



Vinyard Field, Chickamauga park, the scene of one of the most desperate engagements in the fearful 3-day struggle. The monuments and cannons show the positions occupied by the various regiments and batteries

The city of Chattanooga was a prized pawn on the civil war checkerboard, a point of great strategic importance in the western campaigns of the 4-year struggle, an almost impregnable fortress around which Nature had thrown up mountain ranges as barriers. The capture of Chattanooga by the north was imperative in order that the south might



A group of memorials in Chickamauga park, including the Wilder observatory tower

be starved into submission and surrender; it was a gateway through which the food-stuffs passed. In the immediate vicinity of this natural stronghold were fought three epochal engagements—the battles of Chickamauga, Lookout Mountain and Missionary Ridge, battles that made possible the permanent occupation of Chattanooga by the federal forces and which drove home the wedge that opened the way for Sherman's spectacular march to the sea that culminated the western campaign.

There is no better base from which to view the historic environments of Chattanooga than the northern extremity of Lookout mountain, the most historic point in the vicinity of the historic city. Allow your imagination to people the surrounding mountains and ridges with companies, regiments, battalions, brigades and corps, some fighting under the stars and stripes and others massed under the banner of the Lost Cause, think of the smoke of distant chimneys as the ominous smoke of battle and you behold the stirring scenes of a half century ago. You see again the sights and hear again the sounds that marked a mighty epoch in our national history.

Commanding Figure on Orchard Knob

Down in the valley and just outside the present corporate limits of the city is Orchard Knob, where General Grant had his headquarters during the battle of Chattanooga. Forget that it is 1914, take yourself back 51 years and you can see the grim-faced Yankee commander standing on top of the knoll, puffing his customary cigar and with field glasses to his eyes, watching the slow but conquering advance of Hooker's men as they fight their way up the embankments of Lookout mountain.

On the slopes to the south of Orchard Knob is the national cemetery, where more than 14,000 Johnnies, who never came marching home again, were laid to rest on the green hillsides. Two thousand or more

of the tiny slabs, marking the graves of men who fell in battles fought in the vicinity of Chattanooga, have no inscriptions upon them. They designate the last camping ground of the unknown dead, a lost legion of nameless heroes. Semi-circular row after semi-circular row of squares of unmarked, white marble, they add the super-tragic touch to this place of pathos. Buried without a single mourner to grieve for them, without the solemn crunch of the hearse's wheels in the gravel, without the "dust to dust" valediction of the pastor, these men were lowered into the ground and their identities concealed with their bodies as the pits were filled with earth.

Storming of Missionary Ridge

Further to the east towers Missionary ridge, a natural fortification 7 miles long and from 1,400 to 2,000 feet in height, where, on the day following the battle of Lookout mountain, the weary and worn Confederates, under General Bragg, sustained a crushing defeat, in which 3,000 men were killed and 6,000 captured. The storming of this mountain by the federal forces, which swept up the wooded slopes and took trenches at the bayonet's point, ended the

series of battles known as the Chickamauga-Chattanooga campaign. The city and the surrounding mountains were evacuated by the southern troops and with Chattanooga as a base of sup-

plies, Sherman started south into the defiles of northern Georgia to march to the sea and make glorious history, history written in the dust of the troop-choked highways and with the light of the burning city of Atlanta illuminating the page on which Fate scrawled with a sword letters in blood.

Looking southeast from the top of Lookout mountain and over the crest of Missionary ridge, the eye rests upon the fearful field of Chickamauga, a level, thickly wooded plain of more than 6,000 acres and one of the six civil war battlefields that the government has preserved as national monuments. Here, for 3 bloody days, 150,000 men grappled on or near the banks of the Chickamauga or "river of death," as the Indians prophetically named it. Thirty thousand men were killed or wounded on this field of valor. One pond, in which the dead fell and to which the wounded crawled for a gulp of precious water, was dyed red with blood. Here Terror and Courage renewed a world-old struggle for the hearts of thousands of mortals. Here swept a monsoon of shot and shell with unceasing whir and shriek; here the zip and thud of death-dealing musketry fire shook the earth with its awe-inspiring, continuous roll. Here General Thomas "stood like a rock," defending Snodgrass hill after the flanks of the Union army had been forced back on the center and the entire line routed; refusing to retreat until ordered to do so by his superior officer, General Rosecrans.

A Field That Ran With Blood

Chickamauga was a chaos of bloodshed. The movements of large bodies of troops were veiled in obscurity because of the denseness of the forests. It was not one colossal engagement, but a series of separate encounters, two or more in progress at the same time, but wholly independent of one another. Battery fire was exchanged at the short and deadly range of 100 yards. The cold steel of thousands of bayonets was made warm with blood.

But a view of Chattanooga's historic environments from the peak of Lookout mountain, wonderful panorama that it is, is not all-satisfying. The tourist, standing on Lookout Point, becomes obsessed with a desire to make a closer, more intimate inspection of these scenic ridges and battlefields. It



Another view of the Chickamauga battlefield. The monuments in the foreground are memorials to Uncle Sam's regulars and were erected by the government

is possible to satisfy such a desire with the minimum amount of effort. Motoring over mountain trails is not arduous in the vicinity of Chattanooga. Excellent roads, with an average grade of 7 per cent, lead to the tops of Lookout mountain, Missionary ridge and Signal mountain on the crests of which skyline drives have been constructed.

More than 100 miles of highway in the vicinity of Chattanooga have been built at government expense and under the supervision of army engineers. All of these roads are of macadam construction and afford an opportunity to explore the 7,000 acres of government reservation, including the entire battlefield of Chickamauga, Point park and Cravens house slope on Lookout mountain, and Tunnel Hill, DeLong point, Ohio mountain and Bragg's headquarters on Missionary ridge. Approaches to these perpetual memorials to American valor also have been built from Ringgold, Lafayette and Stephens Gap, Ga., and from St. Elmo, Tenn., to McFarland's Gap, Ga.

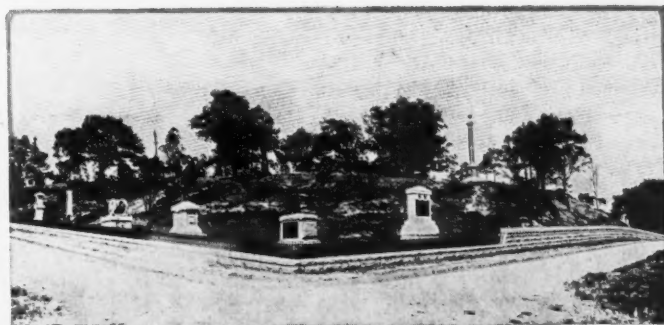
Road Follows Line of Trenches

The boulevard on the crest of Missionary ridge, 8 miles in length and extending from Tunnel hill to Rossville gap, is unsurpassed in scenic beauty and historic interest. The road follows the line of the Confederate trenches and in driving over it, the motorist passes points where the fiercest, most desperate fighting in the assault of the ridge by the Union forces occurred. A steel observation tower now stands where General Bragg directed the defense of the ridge and a battery of guns marks the spot where the lion-hearted Cleburne held his own against fearful odds and twice repulsed Sherman's desperate attack upon the right flank.

In Chickamauga park, 10 miles south of the city and just over the Georgia boundary line, Chattanooga has a historic attraction the equal of which few other cities in the United States can boast. Over this great expanse of gently rolling ground hovers the red romance of war. The blood-drenched acres of this natural forest, on which one of the world's greatest battles was fought, a battle in which the slaughter exceeded that of Austerlitz, Waterloo, the Crimea and Gettysburg, now are studded with monuments erected to the

memory of thousands of fallen heroes. Silent cannon mark the locations of Confederate and Union batteries. Bronze tablets show the position that each regiment, division and brigade occupied during that fearful 3-day struggle. Pyramids of cannon balls indicate the spot where a general fell or where a commander had his headquarters. On Snodgrass hill stands the weather-worn house where Thomas rallied his spent troops after Rosecrans, utterly dejected, had left the field on which his men still were engaged in a life and death grapple with the enemy and in the vicinity of which the wearers of the blue stood their ground and repulsed the crushing attack of Longstreet's corps.

When the famous battlefield was purchased by the United States 14 years ago to be converted into a national monument, \$725,000 was appropriated by congress for the erection of monuments and the improvement of the grounds, walks and driveways. The old roads were reopened and new macadam highways built, the underbrush was cleared away from 3,300 acres, war-time buildings repaired or rebuilt, cleared ground that was in timber during the battle was reforested, historical tablets of bronze, showing the fighting lines of all divisions and brigades for both the Union and Confederate sides, were erected



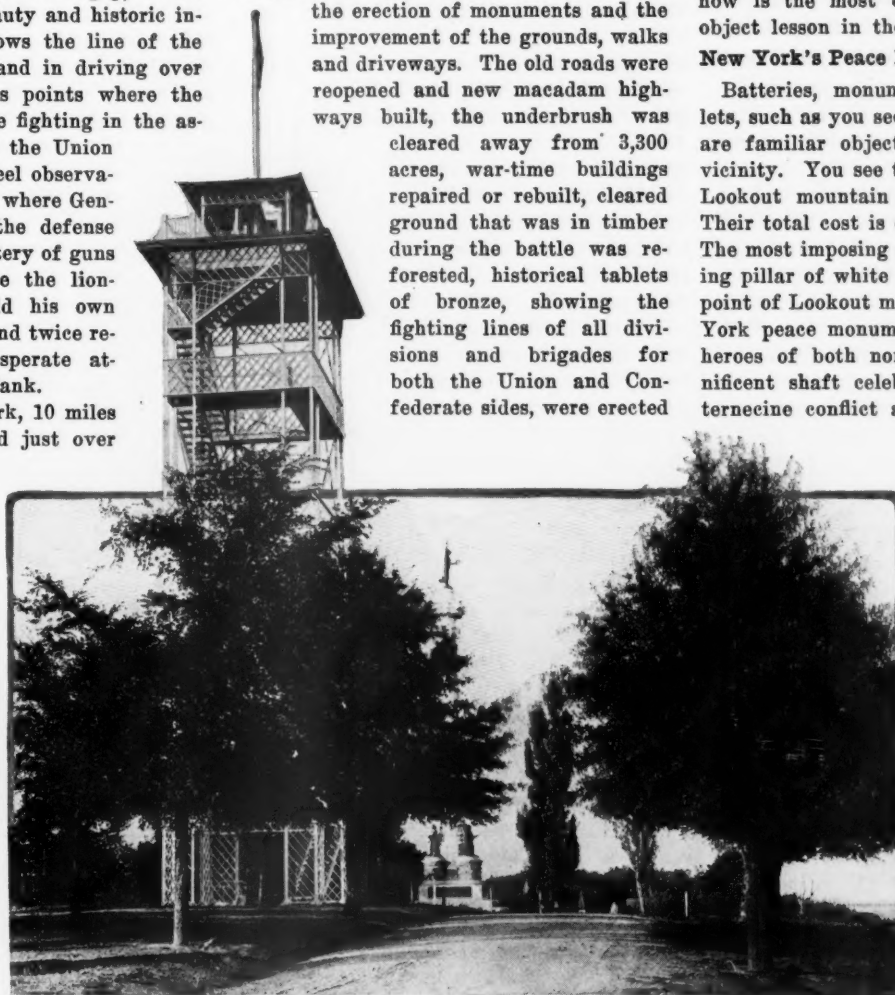
Orchard Knob, where General Grant had his headquarters during the storming of Lookout mountain and Missionary ridge

under the supervision of a national commission, 300 cannon were mounted and placed in position and the old lines of work and fortifications were restored. Four observation towers, three of steel and the Wilder's brigade monument of stone, have been built. Various states and patriotic societies have cooperated with the federal government in the development of the park project and have appropriated more than \$500,000 for the erection of monuments to commemorate the deeds of valor of soldiers from their respective commonwealths. As a result, Chickamauga park now is the most comprehensive military object lesson in the world.

New York's Peace Memorial

Batteries, monuments and bronze tablets, such as you see in Chickamauga park, are familiar objects in Chattanooga and vicinity. You see them on Orchard Knob, Lookout mountain and Missionary ridge. Their total cost is estimated at \$2,500,000. The most imposing and costly is the towering pillar of white marble on the northern point of Lookout mountain. It is the New York peace monument, a memorial to the heroes of both north and south, a magnificent shaft celebrating the end of internecine conflict and the reuniting of a divided country after 4 years of fearful bloodshed and loss of life.

Within the city limits of Chattanooga are two historic objects of especial interest to the student of civil war history. One is an ancient colonial-front building at the corner of Market and Fourth streets, alternately used as a military prison by the Confederate and Union armies in the days when Chattanooga was a prize for which the wearers of the blue and gray fought. The other wartime heirloom is



Skyline drive on crest of Missionary ridge. The steel observation tower marks the site of Bragg's headquarters. Just beyond is the Illinois monument, one of the finest among the 2,000 memorials in the Chattanooga district. The road follows the line of the Confederate trenches

housed in the union depot. It is the famous engine, General, which was stolen by Andrews' raiders in April, 1862, for the purpose of burning the railroad bridges and thus cutting off the Confederate army from its base of supplies.

Pursued by southern soldiers on the engine Texas, the fugitives were forced to abandon the General when they ran out of fuel. Andrews and his men took to the woods, but eventually were captured, eight being executed as spies, eight escaping from prison and six being exchanged as prisoners of war. Andrews is buried in the national cemetery at Chattanooga. Here the state of Ohio has erected a memorial tomb on the top of which is a replica of the engine which the daring officer stole for his famous ride.

Henry VanDyke must have had the southern-bound motorist in mind when he wrote: "The object of the journey is not only to reach the goal but to find enjoyment on the way." The roads from the north, leading to Chattanooga, make such a desired consummation possible. The northern motorist, wishing to visit the battlefields of a half-century ago, has two routes from which to choose,—the Washington-Atlanta highway that serves the tourists of the Atlantic seaboard and the Chicago-Atlanta highway, over which motorists of the middle west travel in their pilgrimages south.

The Chicago-Atlanta highway is a new project. It passes through the states of Indiana, Kentucky, Tennessee and Georgia and leads to such points of interest as the Lincoln farm and the Mammoth Cave. The only bad stretch of road on the entire route is between Nashville and Chattanooga, but the residents in that section are making every effort to have it improved by the time that the 1915 touring season opens.

The Washington-Atlanta highway, an older and much more traveled route, taps a country of great historic interest. Every mile of the way through Virginia is historic ground, for the Old Dominion has been bathed in the blood of American heroes since the days of the birth of the republic. On every side are battlefields on which the blue and gray clashed in the desperate, bloody campaign in which Richmond, the Confederate capital, was the prize sought or guarded by the contending armies.

If you seek history at its pristine source, go south. You'll find it at Chattanooga, on the top of Lookout mountain and the crest of Missionary ridge, among the oaks and cedars of Chickamauga park. You will find it as you drive through Kentucky and Tennessee on the Chicago-Atlanta highway and on either side of the Washington-Atlanta road that crosses the states of Virginia and South Carolina. The battlefields of a half-century ago have lost none of their charm with the passing of the years. They are poignant with sentiment and patriotism.

Speaking Tubes for Race Drivers Latest Idea



The accompanying illustration shows the very latest ideas in racing equipment. It is not a diving outfit, but a telephone connection between driver and mechanic. It is the idea of Ed Rickenbacher, who drove a Peugeot in the recent Corona road race. Rickenbacher found it almost impossible to converse with his mechanic while traveling at speed, so he made a combination headguard, goggles, face mask and speaking tube which enabled him to talk to his mechanic at will.

Chicago Rallies Highway Enthusiasts

Big Good Roads Meeting in Session

CHICAGO, Dec. 14—On the crest of a cold wave that sent the mercury in the thermometer tumbling below the zero point, an army of state and municipal highway engineers and supervisors and a battalion of good roads proponents invaded Chicago today to attend the three-day attraction to be held in the international amphitheater this week—the eleventh annual convention of the American Road Builders' Association, the fifth annual American good roads congress and the sixth annual good roads show.

After a morning and afternoon of registration, the delegates went to the international amphitheater tonight to attend the opening of the good roads show and inspect the exhibits of road-making machinery and materials. The feature of the show is a model highway, 400 feet long and 20 feet wide, constructed in the arena of the exposition building. It has been built in several sections of varied materials and is a most striking object lesson in up-to-date road construction. The United States government and several of the states have exhibits.

The congress will open tomorrow afternoon with the customary addresses of welcome and speeches by A. D. Gash, chair-

man of the Illinois state highway commission; W. G. Edens, president of the Illinois Highway Improvement Association; and Finley G. MacDiarmid, minister of public works for the province of Ontario.

The program for the congress is as follows:

WEDNESDAY

"Road and Pavement Dimensions," Linn White, chief engineer, south park commission, Chicago.

"Road Foundations," J. A. Johnson, division engineer, Massachusetts highway commission.

"Organization of a State Highway Department," John N. Carlisle, New York state highway commission.

"Traffic, Present Tendencies, Probable Development, and Regulation," A. W. Dean, Chief engineer, Massachusetts highway commission.

"Machinery for Construction and Maintenance," T. R. Agg, professor of highway engineering, Iowa State College.

THURSDAY

"Brick Roads and Streets," John Laylin, division engineer, Ohio state highway department.

"Surfaces or Floors for Bridges," Clifford Older, bridge engineer, Illinois state highway department.

"Bituminous Construction and Maintenance," William D. Uhler, bureau of highways, Philadelphia, Pa.

"Concrete Roads," H. J. Kuelling, county highway commissioner, Milwaukee county, Wis.

FRIDAY

"Recent Practice in Construction in Wood and Concrete Blocks," William A. Howell, engineer of streets, Newark, N. J.

"Present Practice in Earth and Gravel Road Construction and Maintenance," Ira O. Baker, professor of civil engineering, University of Illinois.

"Paying in Small Cities," Thomas H. MacDonald, engineer, Iowa state highway department.

"Convict Labor in Road Construction," T. J. Ehrhart, state highway commissioner of Colorado.

"Dust Prevention and Street Cleaning," Charles O. Davis, superintendent of street cleaning, Milwaukee, Wis.

Tomorrow evening the delegates will be the guests of the Associated Roads Organizations of Chicago and Cook County at a banquet at which Governor Edward F. Dunne and Mayor Carter H. Harrison will be the principal speakers. The annual dinner of the American Road Builders' Association will be held Wednesday evening.

HOOSIERS FRAME ROAD LAW

Indianapolis, Ind., Dec. 14—After an investigation covering several months and including public hearings in each of the thirteen congressional districts, the In-

diana state highway commission has concluded its investigations as to the need of highway legislation. The commission is now engaged in preparing recommendations to be submitted to the Indiana legislature in January.

The commission was appointed by Governor Samuel M. Ralston and has served without pay. An exhaustive study has been made and Governor Ralston will co-operate in trying to have the commission's recommendations enacted into law.

A bill is being prepared providing for a state highway commission to serve without pay. This will consist of three members, one appointed by the governor, one by the state geologist and the third jointly by the governor and the president of Purdue university. The latter appointee is to represent the agricultural classes of the

state. The commission will be empowered to appoint a state highway engineer at \$4,000 a year and other needed paid assistants.

JOHN GRAU WINTON WINNER

Cleveland, O., Dec. 16—Awards in the Winton Motor Car Co.'s seventh annual repair expense contest, open to chauffeurs who drive Winton cars, have been made, the winner being John Grau, chauffeur for John F. Casey of Pittsburgh, who covered 24,362 miles with no repair expense. W. H. Franklin, driving for the Boston Last Co., of Boston, won second prize with 27,432.6 miles at a repair expense of \$18. The winner received \$1,000 and second \$500. In all twenty prizes were offered to the contestants.

Albert Guyot Tells of Motoring Adventures in the French Army Service

PARIS, Nov. 28—News has been received from the front of Albert Guyot, one of the leading French race drivers, who will be remembered as a competitor for Delage in the last Indianapolis 500-mile race and the driver of a Sunbeam in the 1913 speed carnival at Indianapolis. Guyot is attached to the headquarters staff of one of the French army corps in the Argonne district, close to the German frontier. He is a member of the motor corps, with the rank of sergeant. After having been in hospital a few days with a slight attack of dysentery, Guyot recovered and resumed his duties.

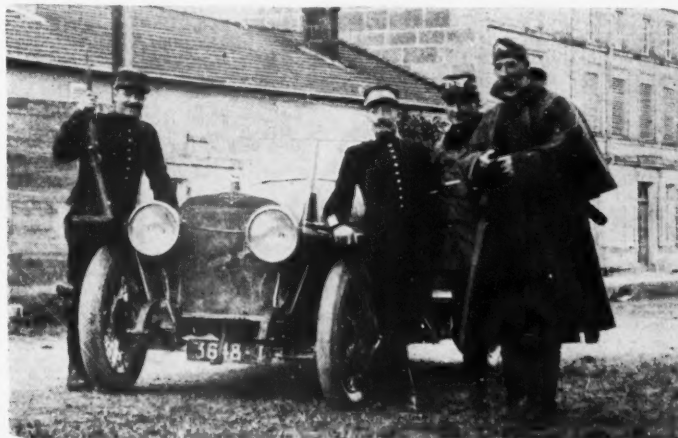
There is a general impression among those who have not been at the front that the men in the motor corps run less danger and display less bravery than those occupying

the trenches or fighting in the open. In this connection Guyot mentions that persons holding this view should pay a visit to the firing line. "Only yesterday," he

writes, "we lost 500 men in half an hour in what was considered a very successful attack on the enemy's lines. Two men who were with me were killed outright. I can only suppose that it is my luck which brought me through without a scratch.

"We realize that it is going to be a long job, and that it will be months before we get back to racing cars again—if ever we do get back. But we have plenty of determination and plenty of patience, and in the end we shall win all along the line."

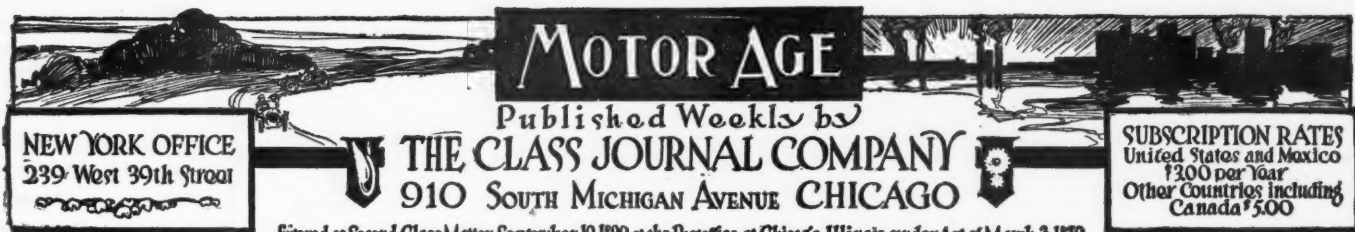
Nothing new has been heard from the other racing stars of late. Goux and Boillat are rendering valiant service driving cars for the officers and all are hoping that the war will end in time to permit them to get over for the Indianapolis race.



FRENCH ARMY MOTORISTS AT CLERMONT-EN-ARGONNE, NEAR GERMAN FRONTIER. TALL MAN ON OUTSIDE IS LACOSTE, DIRECTOR OF HISPANO-SUIZA COMPANY; ON HIS RIGHT IS GUYOT, ONE OF THE LEADING RACING DRIVERS



FRENCH ARMY MOTORISTS PREPARING THEIR DINNER IN A VILLAGE NEAR THE GERMAN FRONTIER. SECOND ON THE LINE IS ALBERT GUYOT, WHO FINISHED THIRD IN THE INDIANAPOLIS RACE THIS YEAR



MOTOR AGE
Published Weekly by
THE CLASS JOURNAL COMPANY
910 SOUTH MICHIGAN AVENUE CHICAGO

NEW YORK OFFICE
239 West 39th Street

SUBSCRIPTION RATES
United States and Mexico
\$3.00 per Year
Other Countries including
Canada \$5.00

Entered as Second-Class Matter September 19, 1892, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

Member of the Audit Bureau of Circulations

Beautifying the Lincoln Way in the Lincoln Way

THE beautification of the Lincoln highway, plans for which are now in the embryonic stage, is a movement deserving of the endorsement and support of every American, be they members of the motoring freemasonry or no. We all have come to regard the great memorial road, even in its present uncompleted state, as the ideal highway of the world, as Abraham Lincoln was the ideal man, and if the ocean-to-ocean highway is to come up to common expectations, it must have the proper environment as well as permanent foundation, lasting surface and perfect drainage.

IF the hopes of thousands of Americans are to be realized, the Lincoln highway must be something more than a road over which the motorist can ride in pleasure and comfort. It must be a road to which all Americans can point with pride and say: "This is our memorial to our greatest partiot. It is the most splendid memorial ever built." The latter statement will lack the ring of truth if the road is lined with unsightly fences and the streams bridged with inartistic structures.

THE work of beautifying the Lincoln highway is a labor that cannot be accomplished in a day, or a year, or a decade. We, of the present generation, only can plant the first seeds and set in the first saplings. The acorns that we scatter along the sides

of the road will not become great oaks in our lifetime, but that is no reason why we should not start the work now. It is work by which the people of future generations will profit, work such as Lincoln himself undertook that those that came after him might reap the benefits of his striving.

CARL FISHER, the founder of the memorial road, once said: "The Lincoln highway never will be finished. You and I will be able to drive over it from New York to San Francisco in 1915. Perhaps 10 years from now every mile will be of concrete. But there always will be something more to do, some improvement to be made. That, to my mind, is the most wonderful thing about the Lincoln highway. Not only is it a perpetual memorial, but a road to be perpetuated by the energies of future generations. We are only laying the foundation now."

IN formulating plans for the beautification of the Lincoln highway, "we are only laying the foundation now." We are planting seeds for trees that will shade the tourists of the future; planting seeds for flowers that will bloom 50 years hence. To work today so that those of to-morrow may enjoy the fruits of our labor, what an inspiration that is! But that is what the Lincoln highway, in all of its ramifications, really is—a splendid inspiration.

Tire Advances

THE more general use of the cord-type of tire in America will go down in history as one of the motoring trends of this year. Heretofore the cord tire has been with us but not in an extended sense, but within the last twelvemonth many makers, who heretofore have not taken a deep interest in it, have become converts in spite of the considerably higher price at which it lists.

IT was scarcely conceivable that there could be broad differences in tires, and that the tire could play a most considerable part in reducing the consumption of gasoline and also in improving the coasting qualities of a car as well as in giving the tire a firmer grip on the road. These are assets of the cord type that the person using them can be convinced of by practical experience. The lower air pressure used and the type of construction are responsible for these facts.

AGAINST these improvements is the greater danger of destruction due to cutting, which cannot be so readily repaired as in a canvas-woven tire. Where a deep cut is received it is generally acknowledged to be a factory repair job. It would be impossible to expect a tire possessing not a few advantages and to be entirely free from defects. In spite of the advantages it possesses on one side and the disadvantages on the other, it is certain that its use will very generally increase in spite of the price handicap it carries with it.

NATURALLY progress in construction is watched with interest by the entire motoring public, consequently one looks ahead a year and anticipates hearing more about this latest step taken by some of the motor car manufacturers.

Battery and Tires

IT will pay you if you expect to leave your car in the garage for a month or more during the cold spell which generally arrives around the first of the year, to give the tires and battery on your car a little attention. If the battery is left in a partly charged condition for a month or more it will deteriorate. Phone your garageman to have it taken out and fully charged and then put in a room where there is a normal temperature until you are ready to take it out again. It will cost a little to have this down but it will be a good investment to you, one of those investments that will be more of a reality to you next May or June than today.

ATTENTION given tires in such winter periods is always worth while. The tire deteriorates. If you are not as yet convinced of it wait until next spring when you try to get your adjustment from the tire dealer and he will give several reasons why the carelessness during the winter ruined a fairly good casing. It may seem quite a bit of trouble to get the wheels, all four, jacked up so the weight is taken off the tires, but it will pay you. Have your garageman do this, and if you are putting your car away for several months, have the casings taken off and wrapped in paper and laid on the shelf. Put a little air in the inner tubes and put them away. Do this with the spare tubes and casings and you will not regret it.

THE forehanded motorist undoubtedly has done this already, but those who may have overlooked this economical suggestion should heed this tip. Now is the time to act—not wait until spring and then regret that you did not have the foresight to protect your own interests.

French President Pins His Faith to the Motor Car

How Poincare Travels to the Firing Line

PARIS, Nov. 27—President Poincaré left Paris this morning for his third visit to the troops in the firing line. As on the two previous occasions the French president traveled by motor car; indeed, Poincaré is such an enthusiastic motorist that he would not consent to any other means of locomotion.

There is an entire absence of ceremony in these trips. The cortege consists of four cars. In the first is the director of the secret service and a couple of his assistants. He is followed by the president riding on this occasion in a 70-horsepower Benz touring car—much to the displeasure of the ardent patriots who are aware of this fact.

The presidential car is driven by Romano, a well-known French race driver who has done a considerable amount of work for the Gregoire company. Romano is a burly native of Marseilles, in which port he acquired from American sailors such a knowledge of American slang and such a refined American accent that he easily can pass for a citizen of the United States. Two officers of the presidential staff ride with Poincaré. The third car carries staff officers.

The fourth car is a Rolls-Royce driven by Journu, a Paris motor car salesman, accompanied by Georges Sizaire. The official function of Sizaire is presidential repairman. He has been selected for this post on account of his complete knowledge of motor cars, which enables him to discover the cause of a stoppage in less time than most men take to think about it. It should be mentioned, however, that Sizaire prides himself on the fact that the cars never have to stop on the road; at the end of each journey he gives them his personal attention and is absolutely certain of them making a non-stop run. Sizaire, it will be remembered, is a well-known motor car manufacturer.

Preparations for the presidential visits to the army are kept absolutely secret; it is not until they are actually on the road that the drivers are given instructions as to direction. A fast pace always is maintained, the detectives' car running a certain distance ahead to warn sentinels of the approach of the president. These precautions are necessary in order to avoid attentions from hostile aeroplanes in the vicinity.

AFTER CAR'S REAL VALUE

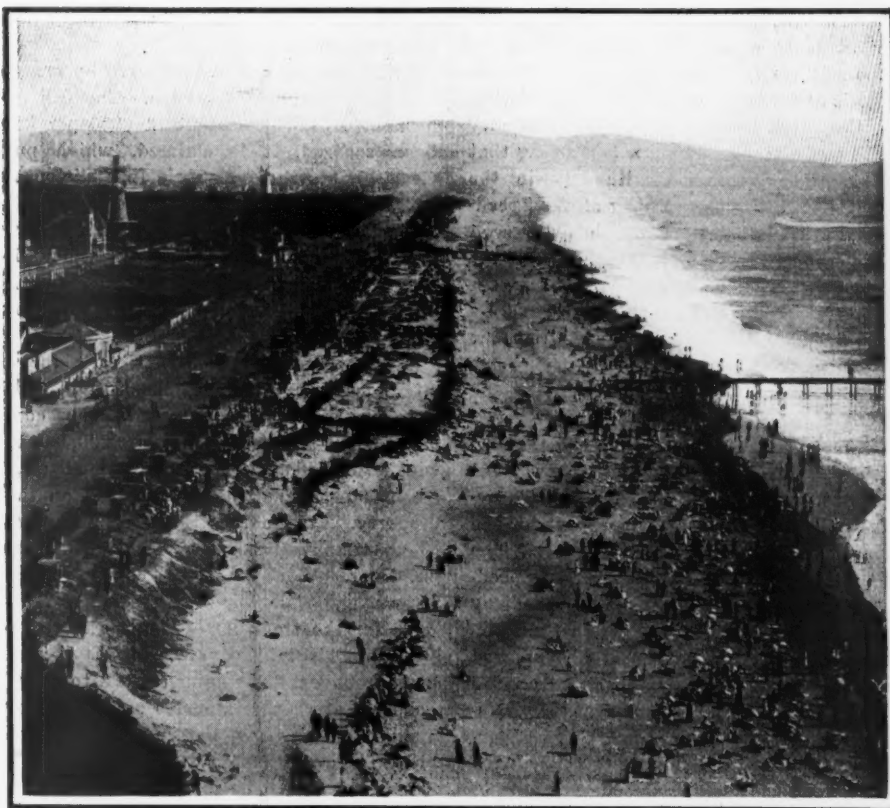
Boston, Mass., Dec. 12—Massachusetts motorists are interesting themselves in a new idea of motor car valuations and if there is time before the next legislature meets a bill will be drawn up to be submitted to the legislature for uniform valuations throughout the state on these vehicles. At present the taxable value de-

pends upon the whims of boards of assessors, and in some cases cars have been continued at the first valuation, which was the maker's list price, year after year, as long as it remained in the city or town. That it is unfair has been admitted but there was no remedy unless one of the members of the board knew about motor car depreciation.

The latest idea originated at New Haven, and it is based upon a very sensible plan. The idea is to put the car on the manufacturer's list price less 10 per cent the first year; the second year it is to be

taxed 25 per cent less than the preceding year; the third year at 50 per cent less than the second year; the fourth year at 20 per cent less than the third year; and the fifth year at 20 per cent less than the fourth year. After the fifth year there is to be no further reduction, the car remaining at that figure. In other words a \$2,000 car would appear in the tax list at \$1,800 the first year; \$1,350 the second; \$675 the third; \$540 the fourth and \$432 the fifth and each succeeding year. This is claimed to be a fair valuation on Massachusetts motor cars.

See America First —
• • • See America Now



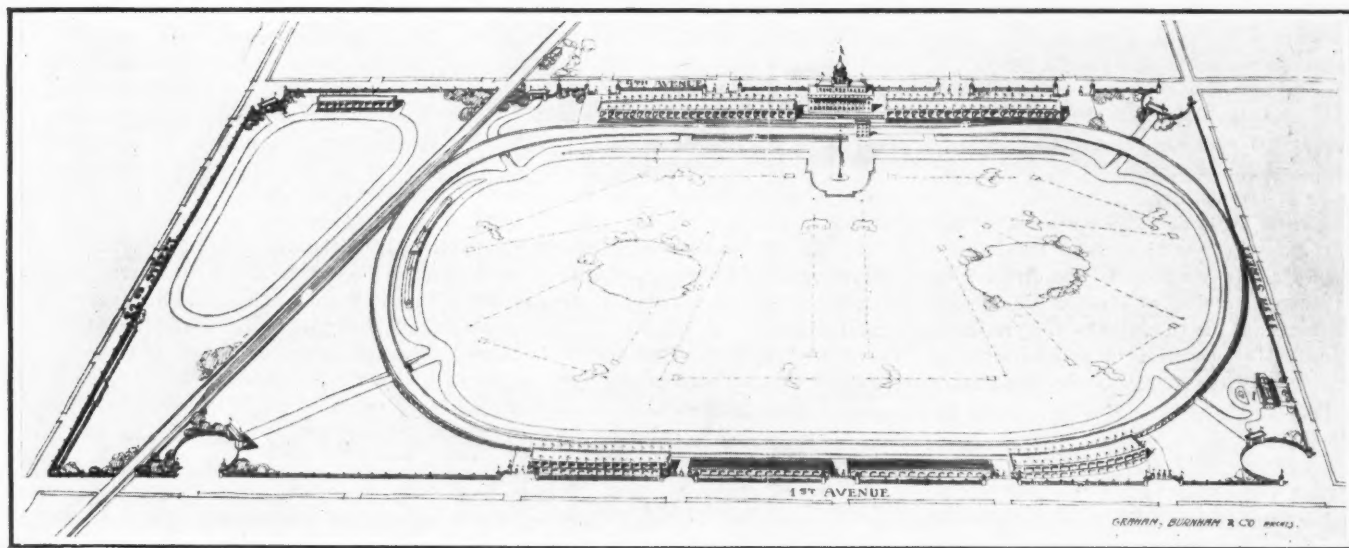
EDITOR'S NOTE—This is the fifth of a series of illustrations and thumb-nail sketches of the scenic and historic wonders of America to be run in Motor Age with the idea of calling the attention of motorists to the picturesque points of interest in their own country.

No. 5—THE BATHING BEACH AT THE WESTERN END OF THE LINCOLN HIGHWAY

The transcontinental tourist, who has motored across the continent from New York to San Francisco, can plunge into the Pacific ocean upon reaching his destination and find in the waters of the peaceful sea a panacea for all the aches and sore muscles contracted on the long ride. The bathing beach at San Francisco is one of the features of Golden Gate park, the Coney Island of the west, and fronts on the Great highway, a splendid motor road which can be seen in the illustration lined with motor cars and extending past the two Dutch windmills shown in the background. These windmills pump fresh water from wells within 100 yards of the Pacific ocean and have wings 120 feet long, made of a single Oregon pine tree.

Chicago Announces It Will Have Board Speedway

Plans Made for 500-Mile Race This Summer



BIRD'S-EYE VIEW OF PROPOSED 2-MILE BOARD SPEEDWAY TO BE CONSTRUCTED AT CHICAGO

CHICAGO, Dec. 15—After having built at least a half dozen speedways on paper, it really begins to look as if Chicago is about to come into its own and that by the middle of next summer this city will have a track for motor car racing that will stand comparison with any in the country. This is the offering of the Speedway Park Association, which announced today that it had placed the contract for the construction of a 2-mile board speedway, which will have to be completed by June 1, under the terms of the agreement entered into.

Started Last June

The association was formed last June, but purposely the organizers have refrained from publicity until all its plans had matured. The climax came last Thursday with the signing of the contract for the actual construction of the track itself. The full title of the organization is the Speedway Park Association and the Speedway Park Club, with headquarters in the Marquette building, Chicago. It has secured 315 acres of level ground situated on the west side of the city, west of the Desplaines river, between Maywood and Riverside, bounded on the north by Twelfth street, on the south by Twenty-second street, on the east and west by First and Ninth avenues, and reached by nine transportation lines. Those who drive from the business section will have a fine 10-mile drive over boulevards.

The officers include: David F. Reid, a stock and bond broker, president; Charles McHugh and Harvey F. Harvey, vice-presidents, and Judson G. Hancock, secretary-treasurer. The directors are George W. McFatrigh, Peter S. Thuerer, C. H. Stebbins, Jay F. Pitts, Joseph Hopp, John Irwin and John C. Roth, all prominent business men. Graham, Burnham & Co.

are the architects and already have the plans well under way.

The financing has been secured by means of a membership proposition. The full allotment of 1,000 members at \$250 per has been secured, it is claimed, which put \$250,000 into the treasury. In addition to that, the directors have pledged \$500,000, for which they will take stock if necessary. The lists having closed, it now is contemplated selling another 1,000 memberships at \$50 a year, which will not carry any stock.

The contract for the track calls for a minimum expenditure of \$500,000 and with the maximum at \$1,000,000. The contractor has given a bond of \$200,000 to complete the work by June 1 and next week 500 men will be put to work on the property. Fortunately the land is vacant, so no time will be lost in wrecking old buildings. Work will be continued all winter.

As for the track itself the surface is to be 2 by 4's laid edgewise with $\frac{1}{4}$ -inch space between. The supports are to be of wood set at proper intervals upon concrete foundations or piers, the bottom of which will be below the frost line. The straightaway runs are to be pitched about 1 foot toward the inside. The north turn is to be figured for a maximum speed of 90 miles an hour. The south turn track level at the outer edge is to be the same level as the north turn, although the radii are not alike.

Dimensions of Track

It has been decided to make the track 60 feet wide in the homestretch, 50 in the backstretch and 70 on the turns. On the first turn there will be three different radii and the whole idea is to secure a speedway that will be safe and at the same time produce interesting competition. As yet the

exact details have not been settled, the architects having been busy getting expert advice. Several consultations have been made with Ray Harroun and Ralph de Palma and a visit will be made to Indianapolis shortly to study the layout there.

The speedway itself is not the whole issue in the proposition, for it also is planned to have golf links, polo fields, aviation course and an equestrian course. Also a fine clubhouse will be erected on the grounds.

First Race June 19

It has been definitely decided to hold the first meet on June 19 and the contest board of the American Automobile Association has placed Chicago on the list tentatively. On February 1, if the track is sufficiently under way to satisfy the A. A. A. the sanction itself will issue.

Chairman Kennerdell himself came on to Chicago to pass on the case and he made a careful investigation before granting the tentative date. He had to fix matters with Galesburg, which had June 16 for a \$5,000 dirt track race, but Galesburg was willing to accommodate Chicago and took June 9 instead, which will prevent a conflict.

The first race is to be at 500 miles and the piston displacement limit will be 300 inches, the same as Indianapolis. The qualifying speed, however, will be 85 miles an hour. As for the prize money, that has not been definitely decided upon. Right now they are talking of a \$50,000 purse, but there seems to be a likelihood of this being reduced to \$35,000 inasmuch as it is contemplated holding another meet next fall.

F. E. Edwards, technical representative of the contest board of the American Automobile Association, has been appointed director of contests of the local track and goes on the job January 1.

Racing Card for 1915 Promises Drivers Rich Rewards

Advent of New Speedways Booms the Game

By C. G. Sinsabaugh

CHICAGO, Dec. 14—With new speedways already announced by Chicago, Minneapolis and Omaha and with a strong possibility of New York and Detroit having a finger in the pie, racing prospects for next year are of the brightest and it looks now as if there would be in the neighborhood of \$400,000 offered in cash prizes at the leading meets. Better still, it looks as if there will be a circuit starting the first of the year and lengthy enough to keep the drivers on the move for nearly 12 months.

As the racing card for 1915 now looms up, the first big engagement will be the San Diego road race on January 9 when there will be something like \$10,000 in the purse. Then San Francisco has its innings with the Vanderbilt on February 22, the grand prix on February 27 and the Panama-Pacific a week later. In the neighborhood of \$20,000 will be hung up in these classics.

Santa Monica May Repeat

Following the exposition meet, it is said that Santa Monica will attempt to regain some of its speed prestige which it lost to Corona, and while no definite date has been set it is reported that this road race probably will be placed on the schedule for March 25. No idea as to how much money will be offered can be had at this time, but Santa Monica always has been a liberal contributor. Oklahoma City, Okla., cuts into the circuit with a 2-day road racing meet on April 30 and May 1, for which a big purse, probably \$10,000 will be offered. This will be a logical jump from the Pacific coast east for the major event of the season at Indianapolis on May 29.

As is well known Indianapolis will as usual offer a \$50,000 purse and the time trials will be run 10 days before the classic is staged. Following the Hoosier event, Chicago with its contemplated speedway, is asking for June 19. Incidentally, it might be mentioned that Chicago wants to

If all the speedway plans mature for next year, American racing men will be in clover for 1915, it being roughly estimated that at least \$400,000 will be offered in the way of prizes at sixteen different meets. If, as has been said before, speedways materialize at Chicago, Minneapolis, New York, Detroit and Omaha, there will be a huge fortune offered, with several going to the \$50,000 limit. As clearly as Motor Age can figure now, the prize offerings should be about as follows:

Indianapolis	\$50,000
Chicago	50,000
New York	50,000
Minneapolis	50,000
Sioux City	25,000
Detroit	25,000
Omaha	25,000
Chicago (Fall meet)	25,000
San Francisco	20,000
Tacoma	15,000
Santa Monica	15,000
Elgin	10,000
San Diego	10,000
Corona	10,000
Oklahoma	10,000
Galesburg	5,000
Total	\$395,000

factory at Indianapolis and a jump to New York and back. Cooper reports that he has signed for 1915 with Harry Stutz and that now it looks as if the Indianapolis concern will be represented on the circuit by only two cars, one of which will be driven by Cooper and the other by Gil Anderson. Cooper hurries home for his match race with Barney Oldfield, which had been set for next Sunday. It is thought that this date must have been changed, for the latest word from the coast is that Oldfield is to race Burman next Sunday in the first of a series of three races.

Ray Harroun, in Chicago over Sunday, reported that he has mailed the Maxwell entries for the San Francisco meet. He will have four cars in the American grand prix, three of them the same ones he campaigned this year and the fourth one of his new 300-inch class racers which will be ready by that time. He will have only three in the Vanderbilt. So far Harroun only has two drivers selected, Oldfield and Carlson.

Indianapolis reports that there is a strong probability of a Sunbeam team coming over for the 500-mile race. Resta, one of the Sunbeam drivers, is trying to get permission from the factory to make the trip and he has in mind bringing with him Jean Chassagne and Guinness, all three of them being ineligible for army service.

VENICE WANTS ROAD RACE

Venice, Cal., Dec. 10—A road race is proposed for Venice. The course has been selected and the city trustees, property owners and motor race boosters are hot on the trail of a road record. It is proposed to hold the event after the San Diego race and before the Vanderbilt and grand prix races in San Francisco in February.

The Venice course is elliptical in shape, $3\frac{1}{2}$ miles in length. The start will be at Lincoln boulevard and Victoria avenue. The course is along Victoria, to Washington and over Washington to Electric avenue and back onto St. Mark's boulevard which is followed to the finish line. It is proposed to put up a purse of \$10,000 for the race, a free-for-all of 300 miles or more.

BURMAN WILL REBUILD PEUGEOT

Los Angeles, Dec. 10—Bob Burman announced here today that he would rebuild his Peugeot car for the 500-mile Indianapolis race here in Los Angeles. Harry Miller, of this city, inventor of the Master carbureter, is assisting Burman in the work. The Peugeot now has a piston displacement of 347 inches and Burman is building a new set of cylinders which will put the fast car in the 300-inch class. In the San Diego exposition road race, January 9, Burman intends to drive the car as it is; but in the Vanderbilt and grand prix events at San Francisco in February, the speed king will try out his new pistons, if he drives.

Carlson Makes Sensational Climb

Maxwell Driver Goes Up Mt. Wilson in 29:01

PASADENA, Cal., Dec. 8—Billy Carlson at the wheel of a stripped Maxwell 25, today broke the Mount Wilson hill-climb record lowering the former mark 13 minutes 59 seconds. Carlson's time for the 9.41 miles was 29 minutes 1 second. The old record, held by the Stutz, was 43 minutes flat.

The summit of the mountain is 6,000 feet high and the last 3 miles of the course today were covered with soft snow, making the climb dangerous for any car. Several touring cars carrying officials of the Los Angeles Maxwell agency, newspaper men and officials appointed to handle the run, preceded Carlson to the top of the mountain to witness the start.

When all was ready and the road cleared of traffic, the telephone line was connected up so the officials could listen to the start and get the time. Carlson was sent away from the start at a few minutes past 11 o'clock and before he reached the snow line, the ruts made by the touring cars which had gone up ahead, were small mountain streams. Several times the driver skidded to the edge of the bank where a yawning canyon hundreds of feet deep presented jagged rocks and tree trunks.

Long before he could be seen, the roar of Carlson's motor could be heard at the summit. Nearer and nearer the Maxwell came, then flashed around the last turn and finished in a shower of snow and water.

After the finish Carlson said that he took more chances on the 9-mile run than he did in the Corona road race. The mountain road is so narrow that two cars may pass only at certain places where shelves are built out for that purpose. On the entire run, a drop of hundreds of feet is on one side and on the other there is the steep bank.

A blown tire, a misjudged turn or any trouble with the steering apparatus would have cost the car and possibly the life of the driver. Carlson rode alone as he would not subject his mechanic to the dangers of the slippery mountain road.

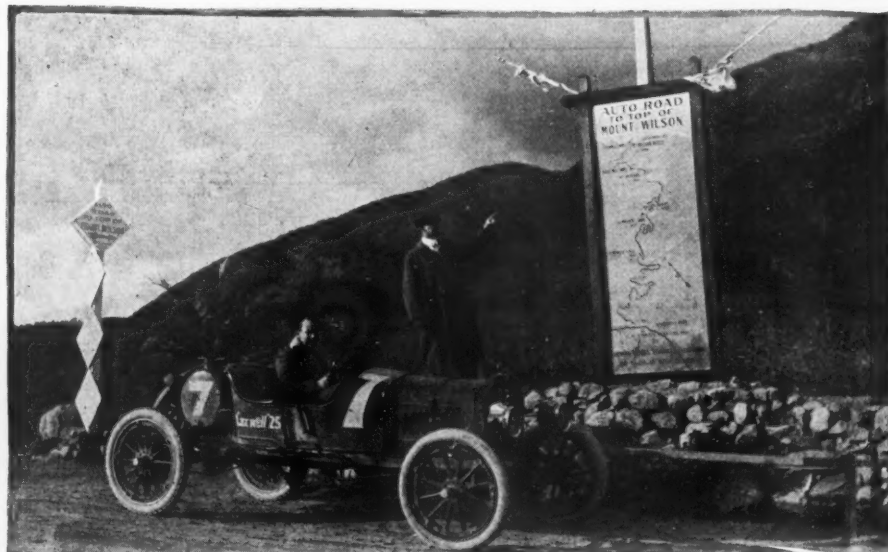
At the finish, the car was a mess of mud and dirt. The melting snow drenched the driver and he was almost frozen about the hands and face at the finish. Mount Wilson is one of the most scenic mountain drives in Southern California and is exceedingly popular with motorists. It is not dangerous when driven at a slow rate of speed in a touring car with a capable driver at the wheel, but at high speed the course is most dangerous.

CRESCENT TRUCK ANNOUNCED

Los Angeles, Cal., Dec. 5—A new light delivery car has made its appearance in Los Angeles. The machine is known as the Crescent and has been placed on the market by the Mission Motor Car Co., of the Southern California city, designed to meet for the tradesman who needs a car of no greater capacity than 600 or 800 pounds. The Crescent is equipped with a 20-horsepower motor.

NEW CAR ON PACIFIC COAST

Los Angeles, Cal., Dec. 9—Another motor car factory for the Pacific coast became a reality when it was announced yesterday that the Silent Engine Co. had purchased a large tract of land in the Los Angeles harbor section for the erection of a plant. The specifications of the new car are not known as yet but it has been announced that the company would build a touring car, roadster and light truck which will retail on the Pacific coast for about \$500.



CARLSON AFTER HIS CLIMB UP MOUNT WILSON AND MAP OF ROAD SHOWING ITS MANY TWISTS AND TURNS

Gateway to California No Winter Road

Party Investigates Tioga Pass Conditions

LOS ANGELES, Cal., Dec. 9—The Tioga pass, giving entree to California from the east via the far-famed Yosemite valley, is not adapted to year-round motoring.

This was determined by a party of motorists who explored the pass and surrounding country in two Maxwell machines, the trip being financed by the Maxwell Motor Co. The little cars were sent over the slippery trails and through the snow banks until a solid 4-foot wall of white blocked further progress, several miles from the summit of the Tioga.

That the pass is not a feasible winter route was learned before the trail-blazers had gone 20 miles out of Merced, in the San Joaquin valley. One of the hardest early-season storms of recent years made the roads treacherous and the grades doubly difficult, but the explorers pressed on, disregarding the repeated warnings of rangers and mountaineers. Toward the end of the upward trip the snow was so heavy that roads were completely obliterated. One of the government rangers blazed the way on horseback, but finally he refused to go further.

According to the opinion of members of the party, voiced when they returned here today, the Tioga pass route would make a beautiful entering point for eastern motorists coming here in summer. From Mono lake to the top of the pass, on the eastern side of the Sierra Nevada mountains, the state maintains a good highway. The Tioga Road Co. owns the rest of the trail into the Yosemite valley, and keeps it in good shape. From the Yosemite to Central California points there are several good lanes of travel, the best known being the Big Oak Flat route.

It is probable that the road will be posted and opened to general traffic before next summer. W. J. LaCasse, the Maxwell distributor in Fresno, is taking the matter up with various commercial and civic organizations in that district, and a short connecting link with the Midland trail and then on to the Lincoln highway undoubtedly will be constructed.

MAKE TRAFFIC LAWS UNIFORM

Detroit, Mich., Dec. 12—F. H. Elliott, general secretary of the Safety First Society of Greater New York, was the speaker at a luncheon of the Detroit board of commerce yesterday.

Mr. Elliott suggested that each of the governors of all the states of the union should appoint a traffic commissioner or a commission and that all states should get together and work upon a uniform and similar safety-first plan instead of having different rules and regulations in every state. In other words, there should be a standardization of traffic regulations throughout the country, because no matter

whether it is New York or San Francisco or Denver or Dallas, conditions are in general about the same in the whole country and uniformity in rules and regulations would only tend to increase their efficiency.

The closing of certain streets in the congested districts to all vehicle traffic during certain hours of the day and roping them off to thus provide a playground for school children, is something Mr. Elliott suggested as a means for reducing the number of accidents. One-way traffic, as tried out in New York, is another innovation suggested as well worth while.

On crowded streets Mr. Elliott suggested that left side turns should be eliminated by all vehicles. The appointment of real competent men to examine motor car brakes was recommended. This has been done in New York where five such engineers are now kept busy with this kind of work.

The Safety First Society of Greater Detroit is now a chartered state organization.

NEW YORK WORKS ON SHOW

New York, Dec. 14—The work of decorating Grand Central Palace for the National show to be held January 2 to 9, started last week. While the huge marble structure does not call for a great amount of decoration, the National Automobile Chamber of Commerce show committee nevertheless plans to produce a most pleasing setting for the array of cars to be shown.

The dominant colors will be white, gold and crimson. As usual, the signs at each booth will contain merely the name of the cars, and these will be uniform throughout and of a design never before seen at a motor car show. In the accessory department, the signs will contain the name of the exhibitor. More than 200 men are engaged in painting the signs, building the pillars and casts, and arranging the floral decorations.

Manager S. A. Miles, who also is in charge of the show in Chicago which takes place January 23-30, plans to have a beautiful setting for the cars in the Coliseum and Armory. An old English garden will be the theme of decorations at the Coliseum and no detail of the effect will be overlooked. Manager Miles will announce in detail the decorations for both the New York and Chicago shows next week.

By ingenious engineering several hundred feet of floor space has been added to the Grand Central Palace. However, no matter how much additional room is found there is a constant demand for space and the building will be severely taxed for exhibition room. Last week twenty-eight

additional exhibitors secured space for both shows. Of this number three are makers of motor cars and the balance are concerns which will exhibit accessories and parts. The latest car exhibitors are the Remington Motor Co., the Ogren Motor Car Co., and the Vulcan Car Co.

WANTS OKLAHOMA MOTOR GUARD

Oklahoma City, Okla., Dec. 12—Enlistment of owners of motor cars to form a motor car division of the Oklahoma national guard, the first of its kind in the United States, is the suggestion which has been made to Adjutant-General Frank M. Canton of Oklahoma by Dick Carhart, vice-president of the Oklahoma Automobile Association, of Oklahoma City. He offers to furnish five Overland cars for the use of the department himself in order to start a movement to test the feasibility of the plan for the next state encampment of the militia.

In his letter bringing the matter to the attention of the adjutant-general, Carhart dwells upon the utility of the motor car in the present European war in mobilizing troops with a rapidity which is impossible by railroads as well as upon the fact that supplies for the armies are largely transported by motor cars. He suggests that Oklahoma take the initiative in organizing a motor car corps by having a law passed at the coming session of the state legislature which will authorize the enlistment of owners in a division of this kind.

Adjutant-General Canton has expressed himself in favor of the proposed motor corps and legislation to make such an organization possible in the Oklahoma guards will be asked of the legislature when it meets in Oklahoma City January 9. Several members of the legislature have expressed themselves in favor of the motor corps and if plans do not go amiss, such an organization will be in operation in this state by the next state encampment next summer. The need of such a corps has been demonstrated many times.

AKRON IN GUAYULE DEAL

Marathon, Tex., Dec. 14—Contracts have been entered into by a syndicate of Akron, O., men with a number of ranch owners of this section for the right to grow and gather the guayule shrub upon their rearing several million acres of land. The contracts cover a period of 12 years, it is stated. It is said to be the purpose of the syndicate to ship the guayule shrub to Akron where it will be manufactured into crude rubber. The men who are interested in the proposition are said to be prominently identified with the rubber industry. The construction of a large crude rubber factory either at Marathon or Alpine also is said to be in contemplation.

The value of the guayule shrub as a rubber-producing plant has been thoroughly demonstrated, it is claimed. The only factory for the making of crude rubber in the United States is located here.

Report on Exports and Imports for October, 1914

United States Government Makes Interesting Deductions

WASHINGTON, D. C., Dec. 12—Figures have been compiled showing the exports of motor cars and parts to the non-contiguous territories of the United States during October and the 10 months ended October, together with the figures for the corresponding periods of last year. The figures show that in October, a year ago, three motor cars, valued at \$2,536, and parts valued at \$82, were shipped to Alaska. There were no cars shipped to Alaska in October last and the parts shipments were valued at \$321. During the 10 months' period the shipments of cars increased from twenty-six, valued at \$24,549, in 1913, to fifty-four cars, valued at \$60,703, in 1914, while parts shipments increased from \$3,176 to \$8,100.

Hawaii received 139 cars from this country in October last, the value of which was \$120,247, while in October a year ago twenty-nine cars were sent to the islands, the value being \$49,083. During the 10

months' period the shipments increased from 496 cars, valued at \$861,005, in 1913, to 753, valued at \$764,029, in 1914. Parts shipments decreased from \$8,172 in October, 1913, to \$7,874, in October last, but increased from \$76,435 to \$79,535 during the 10 months' period.

Shipments of cars to Porto Rico increased from twenty-seven, valued at \$31,972, in October, 1913, to thirty-six, valued at \$33,275, while parts shipments fell from \$5,792 to \$5,241. During the 10 months' period the car shipments increased from 232, valued at \$295,703, to 284, valued at \$268,632, while parts shipments decreased from \$71,895 to \$58,358.

During October last five cars were shipped to the Philippine Islands, the value of which was \$10,790, while in October a year ago the number was sixty-nine and the value \$83,474. During the 10 months' period the shipments declined from 550, valued at \$687,300, to 360, valued

at \$371,541. Shipments of parts increased from \$7,776 in October, 1913, to \$8,768, but decreased from \$57,586 to \$43,893, during the 10 months' period.

The detailed figures of the imports and exports of motor cars during October and the 10 months ended October, together with figures for the corresponding periods of last year, were made public today by the federal bureau of statistics. The general figures were published exclusively last week in Motor Age.

OWNERS TO PAY WAR TAX

New York, Dec. 14—Car owners and applicants for chauffeurs' licenses must help pay the new revenue tax, J. A. Parsons, attorney General, decided today. The secretary of state was uncertain as to the application of the new law to his office, and asked Mr. Parsons for a ruling. The tax will be 10 cents more for the 1915 privileges than was paid last year.

DETAILED FIGURES OF IMPORTS AND EXPORTS DURING OCTOBER, 1914

EXPORTS.							
	October, 1913.			October, 1914.			
	No.	Value.		No.	Value.		
Commercial	79	\$ 129,506		672	\$ 2,286,964		
Passenger	1,697	1,663,716		732	678,387		
Total	1,776	\$ 1,793,222		1,404	\$ 2,965,351		
Parts of (not including engines and tires)		\$ 728,470			\$ 404,360		
Ten Months Ending October 1913.				1914.			
Commercial	857	\$ 1,480,046		1,300	\$ 3,353,509		
Passenger	21,872	21,614,434		20,262	17,888,351		
Total	22,729	\$23,095,080		21,571	\$21,241,860		
Parts of (not including engines and tires)		\$ 5,177,262			\$ 4,855,523		
BY COUNTRIES.							
	October, 1913.			October, 1914.			
	No.	Value.		No.	Value.		
France	50	\$ 35,750		108	\$ 171,040		
Germany	32	27,923		2	1,450		
Italy	18	19,172		415	820,982		
United Kingdom	283	250,293		1,461,191			
Other Europe	82	91,421		127	143,916		
Canada	208	423,016		5	8,200		
Mexico	24	41,354		72	51,772		
West Indies and Bermuda	35	36,110		48	33,242		
South America	182	181,230		190	169,582		
British Oceania	356	310,163		63	71,956		
Asia and other Oceania	231	226,094		28	22,091		
Other countries	176	150,087					
Total	1,776	\$ 1,793,222		1,404	\$ 2,965,351		
Ten Months Ending October, 1913.				1914.			
France	714	\$ 546,090		1,152	\$ 796,685		
Germany	890	675,406		1,063	790,552		
Italy	277	241,180		233	151,698		
United Kingdom	4,183	3,184,530		5,545	5,111,008		
Other Europe	1,565	1,355,249		2,736	3,357,408		
Canada	5,558	7,473,333		3,981	5,024,978		
Mexico	199	362,733		73	87,384		
West Indies and Bermuda	405	397,538		466	394,342		
South America	2,271	2,554,210		963	775,504		
British Oceania	2,774	2,585,389		3,075	2,619,212		
Asia and other Oceania	2,001	1,974,777		1,295	1,240,336		
Other countries	1,892	1,644,585		989	883,753		
Total	22,729	\$23,095,080		21,571	\$21,241,860		
October, 1913.				October, 1914.			
Belgium		\$ 180					
Germany		3,228					
England		68,135			103,894		
Canada		79,606			37,093		
Mexico		19,905			9,792		
Philippine Islands		9,418			31,735		
Other countries		56,574			65,045		
Total		\$ 237,116			\$ 247,559		
Ten Months Ending October, 1913.				1914.			
Tires—							
Belgium		\$ 68,949			\$ 301		
Germany		425,773			81,917		
England		1,198,419			1,174,935		
Canada		1,057,285			833,005		
	October, 1913.			October, 1914.			
	No.	Value.		No.	Value.		
Mexico		133,663			59,957		
Philippine Islands		111,257			124,310		
Other countries		453,785			529,407		
Total		\$ 3,481,131			\$ 2,803,912		
Gasoline—							
	Galls.	Value.		Galls.	Value.		
Belgium	750,000	\$ 103,875					
France	795,438	87,410		2,207,508	\$ 286,498		
Germany	700,000	98,000					
Italy				615,013	73,293		
Netherlands							
United Kingdom	4,600,000	634,500		5,224,314	534,030		
Other Europe	691,333	123,478		1,562,067	206,326		
Canada	3,718,886	551,462		3,719,183	316,841		
Argentina	2,599,288	464,660		233,987	41,770		
British Oceania	623,273	121,157		124,644	22,071		
Other countries	571,740	124,382		351,000	64,840		
Total	959,052	183,365		3,087,450	424,160		
Total	16,009,008	\$ 2,495,498		18,108,166	\$ 1,971,029		
Ten Months Ending October, 1913.				1914.			
Gasoline—	Galls.	Value.		Galls.	Value.		
Belgium	2,221,980	\$ 259,694		2,688,528	\$ 322,714		
France	8,528,018	867,946		24,372,713	2,923,123		
Germany	4,223,060	394,146		3,733,361	464,410		
Italy	1,429,195	194,565		6,824,723	699,358		
Netherlands	5,984,189	797,616		4,372,676	546,010		
United Kingdom	14,150,166	2,022,550		31,044,913	3,207,443		
Other Europe	2,881,131	467,037		6,472,334	906,067		
Canada	33,781,865	4,534,190		27,120,389	2,633,897		
Argentina	6,078,137	1,232,217		11,034,414	1,868,250		
Brazil	10,296,634	1,871,756		2,818,357	428,630		
British Oceania	3,170,094	652,420		5,765,187	1,103,578		
Other countries	6,799,393	1,343,862		13,908,678	2,123,024		
Total	100,353,871	\$14,667,989		140,275,273	\$17,386,543		
IMPORTS.							
	October, 1913.			October, 1914.			
	No.	Value.		No.	Value.		
Motor cars	29	\$ 74,646		32	\$ 79,476		
Parts of (except tires)		50,595			85,564		
Ten Months Ending October, 1913.				1914.			
Motor cars	No.	Value.		No.	Value.		
Parts of (except tires)	417	\$883,445		218	\$373,086		
Total		242,031			784,188		
BY COUNTRIES.							
	October, 1913.			October, 1914.			
	No.	Value.		No.	Value.		
France	15	\$ 38,961		2	\$ 1,837		
Germany	1	3,000		1	3,852		
Italy	6	11,455		1	2,526		
United Kingdom	5	16,691		22	67,439		
Other countries	2	4,539		6	3,825		
Total	29	\$ 74,646		32	\$ 79,476		
Ten Months Ending October, 1913.				1914.			
France	158	\$370,272		60	\$118,204		
Germany	78	205,931		11	20,468		
Italy	74	137,373		67	76,906		
United Kingdom	42	128,993		46	118,469		
Other countries	65	140,876		34	39,099		
Total	417	\$883,445		218	\$373,086		

Premier Trustee Ordered to Continue the Business

Creditors Believe Indianapolis Concern Can Be Saved

INDIANAPOLIS, Ind., Dec. 14—Frank E. Smith, who has been receiver of the Premier Motor Mfg. Co., was elected trustee of this organization, at a meeting of the creditors before Referee in Bankruptcy Albert Rabb, here and the manufacture of the Premier car will be continued.

The meeting brought out the fact that the Premier is enjoying prosperity under the administration of Mr. Smith, more business having been done during the period of receivership, than in a similar period before the appointment of the receiver.

Mr. Smith showed to the court the interest that has developed in connection with the Premier and the unanimous belief of creditors, dealers and owners that, if possible, the Premier should continue in business.

The Premier difficulties in the courts, started on October 17, and since that time Mr. Smith had pruned down the organization, manufactured cars, sold them, and in various ways, profitably adjusted the financial affairs of the company, resulting in the successful building and distribution of the product.

That the Premier company will be allowed to exhibit at the Chicago show, carry on an advertising campaign, and bring out a new model car, in addition to the current models, were all brought up for discussion before the referee in bankruptcy and the assembled creditors.

Harold O. Smith, the former president of the Premier Motor Mfg. Co., is now sojourning in Florida.

WALKER ABSORBS CHICAGO ELECTRIC

Chicago, Dec. 14—The Walker Vehicle Co., of this city, maker of electric commercial cars, has purchased the factory and business of the Chicago Electric Motor Car Co., maker of Chicago electric passenger vehicles, which concern suspended business in October of this year. The manufacture and sale of Chicago electrics will be continued, the construction work to be done at the plant of the Walker company and the sales for Chicago on the site of the former sales agency for these cars.

With the transfer of property practically the complete organization including the factory and service men will continue with the Walker company, Gail Reid formerly secretary and sales manager of the Chicago Electric Motor Car Co., taking the office of general sales manager.

Under the name of Chicago electrics the Walker company will market three models known respectively as the 151, 153 and 152. Models 151 and 153 are rear-drive four-passenger limousines and 152 a five-passenger front-drive limousine. The

price of the 151 and 153 is \$2,650 and of the 152, \$2,850.

The Chicago Electric Motor Car Co. was organized in 1912 by the late Frederick J. Newman. It was reorganized in November, 1913, for the purpose of expanding the business and invading the commercial car field. In October, 1913, arrangements were made to liquidate the entire business.

NEW MOTOR SERVICE PLANNED

Wilmington, Del., Dec. 14—"If a resident of this city comes to us and wants to be carried to Japan or the interior of Africa, and he has the money to pay for it, all he will have to do will be to step into the car and start."

This statement was made a few days ago by Grantley P. Postles, head of a new company formed here to furnish motor transportation between the cities and towns of Delaware and between railroad points. The experimental step, between towns in the lower part of the state, which was inaugurated several weeks ago, has proved so encouraging that the service is to be extended to all parts of the state and as far outside as a patron desires to go. At present there are regular lines between different towns and railroad points, and it is to be extended so as to include the points not now reached. Mr. Postles plans an immense garage, to be located in this city, which will be equipped with nearly every variety of car from the small electric to a giant truck, for the service includes freight as well as passengers.

With this new statewide service residents in all sections of Delaware will be enabled to make their purchases in Wilmington in person or by mail or messenger and have them delivered the same day, whether they live on the railroads or not. A large number of persons who have been unable to attend the theaters in Wilmington and Philadelphia, Pa., now will be enabled to do so and return to their homes the same night, no matter if they live on a remote farm. There is no late night railroad service in Delaware except down the main line of the Delaware railroad, which

INDIANA OUTLOOK PROMISING

Indianapolis, Ind., Dec. 14—The industrial and financial situation in Indiana has clarified to an encouraging extent and motor car interests regard the outlook for the coming year as very encouraging. Manufacturers of motor cars, parts and accessories have taken on increased activity within the last few days and still further improvement is promised.

The money market is much easier than

it has been for several months, which has permitted a resumption of activity in many lines. Orders for war equipment from European countries has caused thousands of men to be put back to work.

In the rural communities there has been little complaint for farmers have had a prosperous year, due to large crops. The only complaint has been of losses suffered in certain parts of the state through the foot and mouth disease, which caused much live stock to be slaughtered. This loss, however, will not be as large as anticipated.

Motor car dealers feel much encouraged and are reporting satisfactory sales. Much of the present business is for medium and low-priced cars, but a good demand for the higher-priced cars is expected later. A normal business is expected during the coming year.

DOING GOOD WORK FOR MOTORING

Grand Rapids, Mich., Dec. 15—Although formed only last February, the Grand Rapids Automobile Owners' Association, in closing up its first year's business, finds it has a record to be proud of. February 17, 1914, the association received its charter, and within a short time had 300 members. Among its first efforts along the line of making things easier both for car owners and the public in general was the placarding of different roads about Grand Rapids and the placing of danger signs.

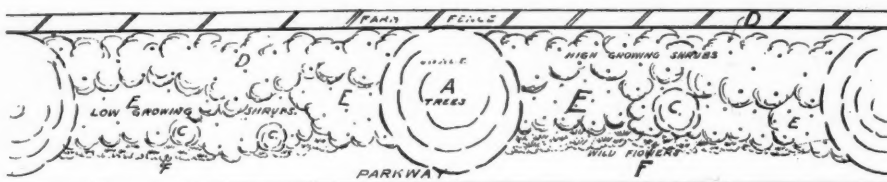
To date the signs have been of the makeshift variety, but new metal signs have been ordered and are expected in the city within a short time. Another good feature of the work has been the co-operation with the police department in helping enforce the motor laws. Ten members of the association were appointed special traffic policemen with the power to arrest, and, as a result, speeding has greatly decreased.

The legal department of the association also has been doing good work, and some twenty-four cases have been handled, all of these having been settled up satisfactorily excepting four, which will be tried at the coming term of circuit court. The association also has been very active in the work of obtaining new traffic regulations, and the city council at present is considering a number of drastic amendments to the traffic laws, these amendments having met with the favor of the association.

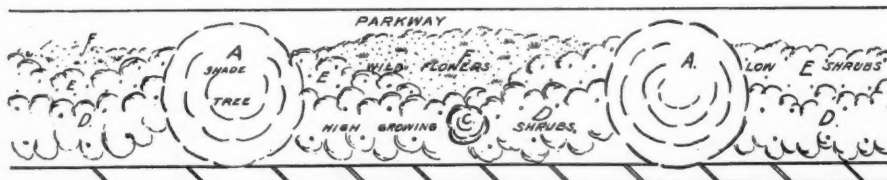
It is intended to make the scope of the organization state wide during the coming year and work hard for better roads. A plan is under contemplation to merge with the Plainfield Automobile Club of this city and take over the clubhouse and grounds 14 miles north of Grand Rapids, giving the association a handsome and permanent home.

Submit Plans for Beautification of the Lincoln Highway

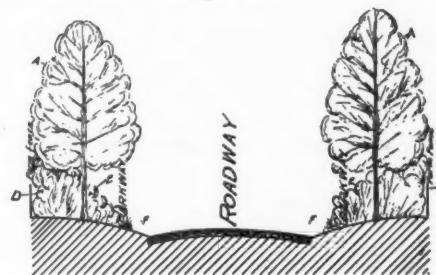
Committee Receives Designs from Forestry and Horticultural Experts



ROADWAY



PROST PLAN FOR BEAUTIFICATION OF THE LINCOLN HIGHWAY



Cross Section

CHICAGO, Dec. 14—The Lincoln highway is to be something more than a modern motor road of concrete, 3,400 miles in length and linking New York with San Francisco. The most serviceable memorial ever conceived and built by man, it is to be as aesthetic as it is utilitarian. It is to be a memorial worthy of the man whose immortal name it perpetuates; it is to be as beautiful as is the life and character of the world-loved martyr it honors, Abraham Lincoln.

To Make Memorial Ideal Road

To make the Lincoln highway the ideal thoroughfare, not only of America but of the world, is the aim of the Lincoln Highway Association. Such, too, is the aim of the American Institute of Architects, which in June offered to supervise the beautification of the transcontinental route, and of various patriotic societies, civic associations and state federations of women's clubs that will raise money for the planting of trees, shrubs and flowers and the erection of monuments, markers, bridges and drinking fountains along the road.

In the more practical work of grading and scraping and the pouring of concrete, the beautification of the Lincoln highway has not been overlooked. The offer of the American Institute of Architects to lend it services toward the supervision of the aesthetic features of this great memorial was accepted by the Lincoln Highway Association early last summer and for the past 6 months, the Lincoln highway committee of the first named organization has been considering plans for the general beautification of the road and offering suggestions to scores of clubs and individuals wishing to improve certain sections of the thoroughfare.

Sub-committees—one for each of the districts into which the Lincoln highway organization is divided—were appointed by the Lincoln highway committee of the American Institute of Architects and at the annual convention of the institute, held in Washington, D. C., the week of December 4, the chairmen of these sub-committees met with the members of the general committee to outline plans for the coming year.

"There was a great deal of enthusiasm shown," said Elmer C. Jensen, of Chicago, chairman of the institute's Lincoln highway committee. "All the way from the Atlantic to the Pacific the feeling is general that the Lincoln highway should be a beautiful road as well as a useful road. The committee's correspondence, letters asking for advice and suggestions regarding the beautification of highway, is so great that the secretary, Elmo C. Lowe, of Chicago, has been forced to work overtime to handle it. Not only have people living on the Lincoln highway asked for suggestions but those on other roads as well.

Collects Data on Foreign Roads

"One member of the committee, Benjamin S. Hubbell, of Cleveland, has taken upon himself the duties of bibliographer and now is collecting pictures of and data on beautiful highways the world over that the features of these roads may be incorporated in the Lincoln highway.

"It is my intention, as well as that of other members of the committee, to motor over the Lincoln highway either in the spring or summer in order that we will be better able to advise and suggest plans for the improvement of the road.

"It is very probable that a national

commission will be appointed at an early date to formulate a comprehensive plan and outline the general principles underlying the construction and beautification of the Lincoln highway. At the annual meeting of the American Institute of Architects, the board of directors were requested to consider how such a commission could best be formed.

"Personally, I believe that such a commission should be composed of men of national reputation, men whose views carry weight. The duties of such a commission will include the settlement of questions regarding the planting of trees, shrubs and flowers, the use of walls and hedges instead of unsightly fences, the design of monuments marking entrances to towns and cities, historic places and state lines and the plans for memorial bridges, artistic road markers and drinking fountains.

Uniform Plan is Not Favored

"The institute does not favor a uniform plan of beautification. That would be impractical and monotonous to the eye. We will not attempt to plant a species of tree in Utah, for example, that will not grow in sandy soil. We will insist on harmony in the aesthetic embellishments of the highway, however. We will look with favor upon monuments and bridges that are symbolic of the section which they are to ornament. The mission style would be very suitable for California. In the desert country, trees could be planted so as to convey the idea of oases. The markers and memorials scattered through the plains should be rugged, characteristic of the rugged pioneers who first dared invade the hunting grounds of the redskin.

"There is much fascination in planning for the beautification of the Lincoln highway. You may allow your imagination full play and the more imagination you have, the better will be your planning. And the knowledge that you are assisting in the achievement of a great patriotic work is sufficient reward for all this dreaming, planning, work or whatever you may call it.

"The beautification of the Lincoln highway is a movement that already has gained much impetus. Three men have offered to build one memorial mile each and our

committee now is working on the plans for one of them. The beautification of the Lincoln highway will be far-reaching in results. It will lead to the beautification of other roads."

Two plans for the beautification of the Lincoln highway recently were submitted to Mr. Jensen for the consideration of his committee. One is the work of J. H. Prost, Chicago city forester. It has received the indorsement of the Illinois Federation of Women's Clubs which, with the federations of three other states—Iowa, Kansas and Ohio, has offered to solicit funds to defray the cost of buying and planting trees, shrubs and flowers for the decoration of the memorial thoroughfare in four commonwealths.

The plan of City Forester Prost, which was exhibited at the good roads show in Chicago this week, calls for the planting of large hardwood trees—elms, maples, oaks, sycamores, lindens, ashes, locusts, hackberries, etc.—at intervals of 50 feet with low-growing, flowering trees—thorns, wild crabs, cherries, plums, red buds, June berries, etc.—set in between. The property line on each side of the road is to be screened by high-growing shrubs—sumac, elder, honeysuckle, tamarix, viburnum, etc.—with low shrubs—spiraea, snowberry, forsythia, wild berries, barberries, currants, duetzas and all the wild roses—in front of these. Next to the road will be planted the wild flowers, such as astors, golden rod, trilliums and violets.

Birch Trees Warning Signal

One distinctive feature of the Prost plan is a clump of three white birch trees set at every bend or corner of the road as a danger signal to motorists.

If the Prost plan meets with the approval of the Lincoln highway committee of the American Institute of Architects, the Illinois Federation of Women's Clubs will begin its campaign for funds and send out thousands of pamphlet copies of the plan. The design of Chicago's city forester, if carried through in all of its details, will mean an expenditure of \$1,962 a mile, the cost being divided as follows: 210 large trees, \$262.50; 400 small ornamental trees, \$300; 3,000 high-growing shrubs, \$600; 3,000 low-growing shrubs, \$400; 5,000 flowers, \$400.

Another most interesting plan for the beautification of the Lincoln highway is the suggestion offered by Wilhem Miller and Franz A. Aust, of the department of horticulture of the University of Illinois, in which they recommend that all trees, shrubs and flowers planted along the memorial road shall be symbolic of the life and character of Abraham Lincoln, each tree, shrub or flower serving the same purpose as the lietmotif in a Wagnerian opera.

In their desire to obtain symbolism, they would not sacrifice practicality. They have selected trees, shrubs and flowers that shall be permanent, adapted to road conditions and possessing year-round and decorative beauty and have grouped them in

combinations that are natural, not artificial. The savants of the University of Illinois interpret the motifs of the trees, shrubs and flowers, which they have selected for the decoration of the Lincoln highway, as follows:

TREES

The White Oak—This typifies the national appeal of Lincoln's character, as this oak has the widest range of all the oaks native to North America. It also stands for his far-sighted ideals since the white oak cannot be transplanted in large sizes, and is best grown from the seed. The acorns might well be taken from the most famous white oak connected with Lincoln's life; perhaps there is one at the White House, Gettysburg, or on the old farm in Illinois.

Red Cedar—This typifies the permanence of Lincoln's fame and since evergreen naturally suggests immortality, it is symbolic of his martyrdom.

Flowering Dogwood—This is symbolic of Lincoln, the rail-splitter, for dogwood was one of the hardest of all trees known to the pioneer and much prized by him for the making of wedges.

Kentucky Coffee Tree—This will remind the tourist of Kentucky, the state of Lincoln's birth.

Silver-Bell Tree—This suggests the tender side of Lincoln's personality as revealed in his home life, and perhaps the perfect English of his Gettysburg address.

SHRUBS

Juneberry or Shad Bush—This typifies the mystic sign of Lincoln's personality, since he never revealed himself to any man. The mystic quality of the Juneberry resides partly in its precocious bloom since the flowers appear before the leaves in April and partly in the long slender petals which are full of poetry, especially when moved by the wind.

The Prairie Rose—This typifies Lincoln's heart—his forgiveness of soldiers who slept on duty. This single wild rose, blooming in late June and July, was a familiar sight to Lincoln in the prairie state. Both foliage and flower have a certain rustic quality which is appropriate to Lincoln's physique.

The Sheep Berry or Nanny Berry—This suggests the lank form of Lincoln, as it is a very tall bush, which sometimes attains to the height of 20 feet.

Fragrant Sumac—This symbolizes the hardness of Lincoln, as it is notorious as a drought resister. It has a leathery and highly polished leaf, suggesting cheerfulness under adversity.

Fox Grape—Symbolic of sweetness and fragrance. The berries signify the Lincoln story-telling ability. His stories had a peculiar pungency and took the sting out of the disappointment he had to occasion by denying the numberless requests that were made of him. This plant should be trained up to a Kentucky coffee tree, for it is as northern as the latter is southern, and the union of the two typifies the ideal for which Lincoln strove.

FLOWERS

Jack-in-the-Pulpit—This typifies the boy-like quality in Lincoln. In spite of carrying the greatest burden of any man of the age, he retained the exuberance and elasticity of a boy and always was in sympathy with youth. The happy and boy-like quality of the Jack-in-the-Pulpit has been noted by many nature writers.

American Bluebell—This suggests Lincoln's home life. The flower is pink in the bud, but blue when it opens. The blue might stand for Lincoln and the pink for his wife. The bluebell is a flower apart, as Lincoln was unique among his kind.

Purple Cone Flower—This symbolizes aspiration. It is a common prairie flower blooming in June, with a head about 4 inches across and petals which are below the level of the disk but which seem to aspire rather than to droop.

The Rosin Weed—This typifies Lincoln's backbone—the firmness and inflexibility of his purpose when he was sure he was in the right. This characteristic is suggested by the strong stiff stem.

KENTUCKY IN A TAG WRANGLE

Louisville, Ky., Dec. 12—Louisville owners whose licenses are about to expire were puzzled yesterday when the Louisville Automobile Club was advised by the commissioner of motor vehicles at Frankfort not to forward to Frankfort any applications for license renewals, owing to the refusal of Secretary of State Crecelius to accept the recent definition of his duties handed down by the attorney-general.

It also was made known that Secretary of State Crecelius had informed the club that applications for licenses sent to his office would be refused. Eugene Stuart, assistant secretary of the club, who already has forwarded a large number of applications to the office of the commissioner of motor vehicles, will lay the matter before the executive committee of the organization Monday at a special meeting.

Mr. Stuart was informed yesterday by several motorists that checks and applications sent by them to Frankfort had been returned without ample explanation and that they were without knowledge as to what steps to take, in view of the fact that their licenses were about to expire and that without new licenses they would be subject to prosecution.

About 7,500 licenses, one-fourth of which are those of Louisville motorists, will expire January 1. The club, through which the licenses are usually renewed, has been sending out letters urging members promptly to make their applications, and these are being received daily.

NEW YORKERS ORGANIZE NEW BODY

New York, Dec. 14—There is being organized today in Syracuse, N. Y., the New York State Federation, an organization of motorists who are breaking away from the New York State Automobile Association, the state body allied with the American Automobile Association. The new organization is a result of opposition to the older body and it is expected that the three big motor organizations of the state, namely clubs from Buffalo, Rochester, Syracuse and the metropolitan consulate of this city will combine in the new organization, giving a total membership of approximately 10,000. With this loss the old organization will have approximately 5,000 remaining members. The new federation will affiliate itself with the A. A. A.

ELECTRICS MAKE MILEAGE RECORD

Los Angeles, Cal., Dec. 12—One of the most remarkable performances ever staged with electric pleasure cars occurred this week on the Beardsley electric owner's tour from Los Angeles to Orange, Cal., and return. The course is hilly and is not an easy trip for an electric to make, although it is over the excellent boulevards of Los Angeles and Orange counties.

Fourteen electric pleasure cars and an electric truck competed. After the return to the city, a banquet was tendered to the owners by the Beardsley company officials. After the dinner, the run was resumed and trophies were awarded to the owners making the longest mileage for the day.

It was necessary to finish the run in a drenching rain over the slippery streets. The cars did remarkable work, however, the winning score being 112.1 miles on a single charge. The average mileage for all cars participating in the run was 100.1 miles, which establishes a new record for electric mileage over country roads.

Washington Puts \$13,000,000 Into Its Highways

State Accomplishes Wonderful Results in 2 Years



The magnificent Bothell road north of Seattle, paved with brick. It is one of the most scenic routes in the state, skirting the shores of Lake Washington, which body of water is shown down the road. The stream at the left is a favorite haunt of motor boat enthusiasts

THIRTEEN millions of dollars! That is the staggering sum of money expended in the construction and maintenance of highways in the state of Washington during the biennium 1913-1914, according to figures just compiled in the office of the state highway commission at Olympia.

It marks a period of activity in good roads work that is without parallel in the Pacific northwest, and is a record that places the Evergreen state up among the leading commonwealths of the union in the matter of highway improvement. In this enormous sum is represented the first actual construction of a comprehensive system of arteries that describes a network across the entire state.

Washington farmers, motorists and business men have taken cognizance of the necessity—and great benefits—of good roads, and their wishes are reflected in the statewide program outlined by the 1913 session of the legislature; and there is every reason to believe that the system of roads will be carried through to completion during the biennium of 1915-1916, when, it is estimated, not less than \$10,000,000 will be expended in bettering traveling conditions.

Seven Kinds of Road Surfaces

Due to the aggressiveness of the state railway commission, the various boards of county commissioners and the persistence of public spirited organizations such as motor clubs and good roads associations, there were constructed in the state of Washington during the 2 years just draw-

By Frederick Wagner

ing to a close a total of approximately 2,500 miles of roads, representing no fewer than seven different types of construction, from dirt roads to the very highest grade of brick surfacing. In this connection, Washington holds the enviable distinction of having laid down the first brick roads west of the Mississippi river and has more mileage of that type of thoroughfare than any state in the same section of Uncle Sam's great domain.

Counties Also Active

While the state government appropriated an enormous amount of money for highways and made commendable progress, the thirty-nine counties that make up the commonwealth of Washington were not far behind in activity. Out of the public highway fund there was expended approximately \$1,750,000 during the 2 years on 233 miles of roads. The permanent highway fund was extremely generous, contributing \$3,330,888 toward the construction of 431.77 miles of permanent roads. The thirty-nine counties spent approximately \$4,750,000 in building roads, mostly of the gravel type, and disbursed \$3,220,000 in maintenance work.

Washington is making progress in laying down hard-surfaced thoroughfare, the major portion of which are located where traffic is the heaviest. During 1913 and 1914, there was built by the state highway commission out of the permanent highway fund, 431.77 miles of roads. Segregated, they were: spread gravel, 98.10 miles cost-

ing \$488,315; rolled gravel, 91.61 miles, \$401,392; Waterbound macadam, 112.77 miles, \$637,715; asphalt macadam, 39.89 miles, \$403,531; Warrenite, 7.67 miles, \$114,676; concrete, 55 miles, \$607,416, and brick, 22.76 miles, \$618,719.

Six Primary Highways

Six primary, or main, highways were included in this work. The greatest amount of activity was on the Inland Empire highway, which reaches from North Yakima, through Walla Walla, Dayton and Colfax to Spokane, on which 67.5 miles were improved. The Sunset highway, extending from Seattle through Snoqualmie pass in the Cascade mountains to Ellensburg and Spokane, ranked second in the amount of work done, 58.7 miles of road having been built, thus connecting the east and west sides of the state with a good, passable route. The Pacific highway, which reaches from the Canadian boundary to Vancouver, Wash., across the river from the Oregon state line, was improved to the extent of 27.7 miles; the Olympic highway, connecting the rich Olympic peninsula with the outside state, was benefited to the extent of 26.25 miles; the National Park highway, which runs from the southwestern part of the state to Rainier National park, connecting with the splendid thoroughfare entering the scenic wonderland from the south side, witnessed the construction of 21.6 miles; while the McClellan Pass highway, extending from a point near Seattle across the Cascades to North Yakima, received 12.05 additional miles. This latter

route will provide two new entrances to the beautiful park that surrounds the base of the majestic Mount Rainier.

The roads built by the different counties during the biennium cost on an average of \$2,400 a mile, practically all being gravel-surfaced. During the same period these counties spent in maintenance a total of \$3,220,000, which, based on a total of 37,000 miles in the state, give an average of \$43 a mile upkeep per year.

More Highways Planned

Plans have been completed by the state highway commission for 22.64 miles of permanent highways costing \$44,481, the greater part of which will be expended on the routes of primary state highways. These plans have been approved, but the contracts have not yet been let.

Out of the \$13,000,000 purse distributed throughout the commonwealth in the past 24 months were built many miles of what is claimed to be the highest type of highway construction—20-foot roads with a 5-inch concrete base, 2-inch sand cushion and 4-inch brick pavement. Practically all the brick roads are in King county, in which Seattle is situated. They cost between \$25,000 and \$30,000 a mile and are located on the route of the Pacific highway leading out of Seattle on the north and south, and were paid for out of the \$3,000,000 bond issue voted by King county.

Washington's highway improvement is being carried out on a systematic basis. The 1913 legislature passed a law providing, or rather designating, a number of

primary roads leading to the trade centers which were to be built first, and a series of secondary routes and authorized surveys and investigations of a number of feeders. Following out the comprehensive program, the state highway commission during the biennium built 213.8 miles of roads on the six primary highways, in addition to accomplishing much improvement on other routes.

Of great importance to the state was the opening of the route across the Cascade mountains known as the Sunset highway. The highway across the state cost upwards of \$300,000. It gives tourists and settlers the first passable highway across the state and means that western Washington will get a big share of the heavy tourist travel in 1915. The new road offers a maximum grade of 5 per cent, and for scenic grandeur is surpassed by no route in the west. The Pacific highway is, however, the most important to the state as a whole, for it serves more than one-half the entire population of the commonwealth. It is along the Pacific highway that the major portion of hard surfaced roads are being built, and it is the plan to eventually have a road of boulevard smoothness from the Canadian boundary to the Oregon state line.

Inland Empire Highway

The Inland Empire highway, in eastern Washington, serves a rich agricultural section, and the coming 2 years will witness further extensive improvement. The Olympic highway has unlocked the vault

of scenic grandeur in the Olympic Peninsula country; incidentally, it penetrates a section that for wealth of timber and agricultural possibilities admits of no equal in the northwest. Until this road was opened this fall, the country was dependent absolutely upon steamship lines. Now, however, Olympic residents can motor to all parts of the state, and the nature lovers from the other districts can invade that section and revel in the grandeur of its magnificent forests, streams, lakes and matchless parks that nestle between rugged snow-capped mountain peaks.

Promise of the Future

Up in the northeastern part of the state a great amount of road construction has been under way, and September, 1915, will witness the opening of another route across the Cascade range. It is known as the Cascade Scenic highway and reaches from the great apple growing regions of Chelan county, through the timbered foothills of the mountains to Seattle. Chelan county spent all its money in improving its section of the highway, so then public-spirited residents subscribed \$10,000 more and finished the project. King county is spending about \$170,000 in building the road across the summit at Stevens pass and down the west slope of the mountains.

As if to hand the lie to the general belief that the railroads are opposed to scenic roads, the Great Northern Railway voluntarily donated the abandoned right-of-way across the mountains to the county, thus giving a splendid roadbed to King



VIEW OF PACIFIC HIGHWAY NORTH OF SEATTLE, SHOWING FINE SURFACE



BRICK ROAD CONNECTING WITH PACIFIC HIGHWAY TO EVERETT

county. Snohomish county must build 6 miles of heavy rock work next spring and then the Cascade route will be ready for travel, for from Index to Everett and Seattle there is a beautiful highway. Valuable assistance has been given Snohomish county by the officers of the Snoqualmie national forest, who have assured the survey of the missing 6-mile link between Index and the King county line. The legislature will be asked at its session next January to provide money for completion of the route.

The splendid progress made during the last 2 years and the absolute absence of any dissension at the fifteenth annual convention of the Washington state good roads convention which was held recently at Spokane, augur well for the future of the better highway movement during the next 2 years. The convention went on record unanimously as favoring the carry-

ing out of the comprehensive road building program mapped out by the 1913 legislature, and when the state law-making body meets in biennial session at Olympia in January, 1915, it will be urged to make appropriations to complete the routes planned before providing for any additional thoroughfares.

This sentiment has the vigorous support of Governor Ernest Lister, members of the state highway commission and a large number of state representatives and senators who are members of the good roads body. These public officials strongly endorsed the action of the convention in recommending to the legislature that the present maintenance fund of 5 per cent be increased; that a more definite system of taking care of roads after they are built be devised and put into operation; and that the present levy of a mill for public highways and a mill and a half for permanent high-

ways be continued. These two funds will provide approximately \$200,000 and \$3,500,000, respectively, or a total of \$5,500,000 during 1915 and 1916. Other state and county funds will bring the total for road work during the next biennium far over the \$10,000,000 mark.

The rate of progress Washington is making in improving its routes of travel can be better appreciated by the report just made by Highway Commissioner William R. Roy, in which he divides the total of 37,000 miles in the state as follows: Improved earth roads, 8,500 miles; gravel roads, 3,700 miles; hard surfaced roads, 550 miles; planked roads, 200 miles; unimproved earth roads, 24,000 miles.

Washington requires no encouragement on the value and necessity of good roads; it's simply a matter of proceeding cautiously in order to avoid excessive taxation and building for permanency.

The Amish Religious Sect Accepts the Motor Car

Central Illinois Colony Has to Rescind Action

BLOOMINGTON, Ill., Dec. 12—Progressive and liberal members of the Amish religious sect have overthrown the opposition to motor cars, and the leaders finally have given a grudging consent to their use. This developed at a meeting of the church at Morton this week.

The Amish are a branch of the German Baptist denomination and have large colonies in central Illinois. At the national conference, held last June in eastern Illinois, efforts to secure the adoption of a resolution permitting the ownership of a motor car was voted down after long debate. There was considerable feeling regarding the proposition, the younger members denouncing the policy which prevented them from discarding the old-time buggy or farm carriage, for the gasoline vehicle. It finally was decided to refer the controversy to the state conferences with power to act.

When the Illinois congregations assembled at Morton, west of here, this week, the subject came up again and this time, the liberal members were sufficiently numerous to win their point.

The Amish people cling to distinctive garb, the men wearing black slouch hats of wide brims and grey clothes, while the women severely made gowns and black poke bonnets. The young women appear in the same garb as the elder, as a rule, although the progressive members are more tolerant and permit their daughters to don apparel more in keeping with the times. The older members have insisted upon retaining the customs of the past, but are finding it difficult to hold the younger in line.

The concession in favor of the motor car is the most radical ever made by the sect, and it is predicted will be followed by changes in attire, permitting members,

when so disposed, to wear clothes in harmony with the members of other denominations. The Amish are all prosperous, being famed for their thrifty and frugal habits. Nearly every family owns a fine farm with abundance of live stock and well maintained buildings. For many years the sect declined to vote on election day. This rule is also becoming obsolete. With the letting down of the bars, permitting the purchase of motor cars, it is believed that a large proportion will invest as all are well able to own one. The action of this mark, marks an important epoch in the history of the denomination.

A. A. A. MEETING POSTPONED

Washington, D. C., Dec. 12—Paul Revere's famous ride will be covered by the motorists who participate in the annual meeting of the American Automobile Association, to be held in Boston in May next. A mail vote of the entire directorate almost unanimously decided for a spring instead of a winter meeting, and so it was that the A. A. A. executive board decided to postpone the big meeting until May 17-18. At that time of the year the main highways in most of the states are in travelable condition, and it long has been the opinion of leading A. A. A. members that the annual gathering should be one to which members could tour.

Massachusetts is one of the few states which have established comprehensive highway systems, and for many the journey will also include New York, New Jersey, and Connecticut, all of which have arrived at a uniform method of procedure. Ohio is another state busily at work upon a main market road system, and all around it is expected that the motorists will add greatly to their road-building ideas en route to the annual convention, one part

of which will be devoted to highway matters.

Boston and vicinity supply a great quantity of places of historic interest, and the modern presentation of the Revolutionary ride from Charleston to Cambridge, to Concord and Lexington will be started by a signal from the old North church.

At the conclusion of the Boston meeting it is quite probable that a party of transcontinentalists will start for the Panama-Pacific exposition in San Francisco, for several A. A. A. officers have signified their intention of making the cross-country trip at this time. There will not be any organized tour, nor is it likely that all will start at the same time and follow the same schedule.

DECISION FAVORS THROPP

New York, Dec. 12—The de Laski & Thropp Circular Woven Tire Co., of Trenton, N. J., through a decision of the court of appeals of the District of Columbia, handed down on December 7, is sustained in its claim to the ownership of the invention relating to the so-called bead-placing rings. These rings are devices used in locating the beads in the margins or clincher edges of tire casings, during their manufacture.

The contest was in the form of an interference between an application for patent filed by John E. Thropp, president of the company, and an application for patent filed by John R. Gammeter and owned by the B. F. Goodrich Co., of Akron, O. Nearly 4 years have been consumed in the conduct of this interference, and the questions of anticipation by prior patents and prior public use, as well as the point of originality of the invention, have been raised and passed upon.

Stewart-Warner Corporation Answers Suit in Horn Case

Asserts Its Hand-Operated Signal Does Not Infringe

NEW YORK, Dec. 15—Denying the charge that its hand-operated horn in any way infringes the Long hand-horn patent No. 1,090,080, and claiming that the patent is invalid, the Stewart-Warner Speedometer Corp., of New York, filed its answer yesterday in the suit brought against it and the Stewart-Warner Speedometer Corp., of Virginia, last month, by Gottfried Piel and the G. Piel Co.

The Stewart-Warner interests claim that the Virginia corporation is not within the jurisdiction of the United States district court for the southern district of New York, in which the suit is brought and their attorney will appear before the court Friday with a motion to dismiss the bill of complaint against it on that ground. On Friday the motion of the Piel company for a preliminary injunction will also come up for hearing.

In the answer filed by the New York corporation it is stated that its business is separate and distinct from that of the Virginia corporation and that its place of business at 233 West Fifty-eighth street is not a regularly established place of business of the latter.

It asks for proof of the ownership of the Long patent and states that it is not true that the Stewart-Warner Speedometer Corp. of New York has made or sold motor car horns embodying the alleged inventions of patent 1,090,080 and claimed in claims 4, 5, 7, 8, 9, 10, 11, 12, 13 and 14. The answer declares that the only motor car horn the corporation has been selling does not closely resemble the hand-operated horn made by the G. Piel company.

It denies that the G. Piel Co. created the hand-horn business and states that the Stewart-Warner corporation entered the business of selling hand horns in straightforward business competition and that it was aware of the construction on the market, none of which, it states, closely resembles the Stewart-Warner warning signal.

The answer goes on to state that the Long patent is invalid for lack of invention, lack of novelty, for excess and for aggregation, and avers that Long secured his patent with intent to defraud and deceive, the structure covered not being his own but that of A. Aufiero, who is now contesting Long's right to the patent in the patent office at Washington. In proof of its charge that the Long patent is invalid the answer cited seven men and firms besides Aufiero who, it states, knew and practiced the alleged invention prior to the alleged invention thereof by Long.

It also cites patents to the number of fifty-nine which, it alleges, embody the ideas of the inventions in the Long patent, and which were granted prior to the latter. The answer concludes by asking that

the bill of complaint against the Stewart-Warner Speedometer Corp. of New York be dismissed with costs.

NEW YORK DEALERS GAIN POINT

New York, Dec. 14—The garage building rules, which were to have been imposed on New York garagemen December 1 and which were suspended at the request of the Automobile Trade Association of New York State, doubtless will remain in suspension for some time.

As requested by Fire Marshal Thomas J. Ahearn, at a meeting in November, the directors of the association met in conference and went over the rules with him last Wednesday, December 9; the result was a request by Ahearn that the association, through its attorney, Charles Thaddeus Terry, redraft the rules according to the trade's idea of feasibility and fairness. This redraft is to be in the hands of the marshal by December 23; the marshal then will make a redraft of his own, following the association's redraft so far as he regards it as desirable. The marshal's redraft then will be submitted to the directors of the association, who will take this revised code up with the marshal.

U. S. REPORTS ON TRUCKS

Washington, D. C., Dec. 12—Both 1½-ton trucks and trailers have been given the official indorsement of the United States army in the annual report of the quartermaster-general for the fiscal year ending June 30, 1914. Trailers also are commended as economical, and while no extensive tests have been made with motor trucks, their operation in regular duty during the year, especially on the Texas border have been carefully studied with the verdict from the pen of Quartermaster-General Aleshire that "it would appear that this class of transportation is entirely dependable" and that "a reduction in animal-drawn transportation has been made wherever motor trucks have been supplied."

The report contains details of expenditures for gasoline, lists of trucks purchased, and of those in service. Purchases of thirty trucks are listed, costing a total of \$73,675, and used at seventeen different posts throughout the United States and territories. All but three of these are of 1½-ton capacity, these being one 5-tonner and two of 2-ton capacity.

Of a total of sixty-one trucks on hand, reports on thirty-five in actual service are given. These thirty-five, except in four instances, are not included with the thirty purchased during the fiscal year, so that of the total sixty-one, every one has been in active service, only two of which having been laid up a part of the year.

Twenty-seven motor cars also are in

use by the army, ten of which were purchased during the fiscal year of 1914. The total cost of the ten cars purchased is placed at \$17,175. Their costs vary from \$2,391 per year to \$45.50, the mileages varying from 17,706 miles to 1,000, and the cost per mile from 14/10 cent to 35½ cents. Three motor ambulances also are in use.

In the Philippines, fifteen motor trucks are in use by the quartermaster's corps, and also eight motor cars and one motor ambulance.

Some very interesting figures on cost are given in the report, deductions from them appearing below:

MOTOR TRUCKS IN U. S. AND HAWAII

Total number reported.....	35
Total cost for fiscal year.....	\$34,273.74
Total mileage.....	105,327
Tons hauled 1 mile.....	209,408
Average cost per vehicle-year.....	\$ 1,038.59
Average miles per year, per vehicle.....	5,919
Average tons hauled 1 mile, per vehicle.....	6,345
Average cost per ton per mile.....	.2213

PENN TO ASK NEW LAW

Philadelphia, Pa., Dec. 14—At a special meeting called to consider prospective new legislation at Harrisburg the coming winter, of interest to motorists, various methods of providing for early improvement of Pennsylvania's roads were discussed by the executive committee of the Pennsylvania Motor Federation recently.

After several speakers had been heard, Ex-State Senator Adams was instructed to draft a bill at the coming sessions of the state legislature providing for the levying of a special state road tax on all taxables, individual and corporation, who now pay a state tax, and including real estate that pays no state tax. The recent defeat of a proposed bond issue for the purpose precludes the possibility of obtaining the money needed by means of an issue of state bonds. The immediate need for systematic and comprehensive road improvement was emphasized, as was also a bill containing a provision that lights must be carried at night on vehicles of every type. Another meeting of the executive committee will be held in a short time for the purpose of adopting the bill to be drafted by Mr. Adams and to urge action by the state authorities.

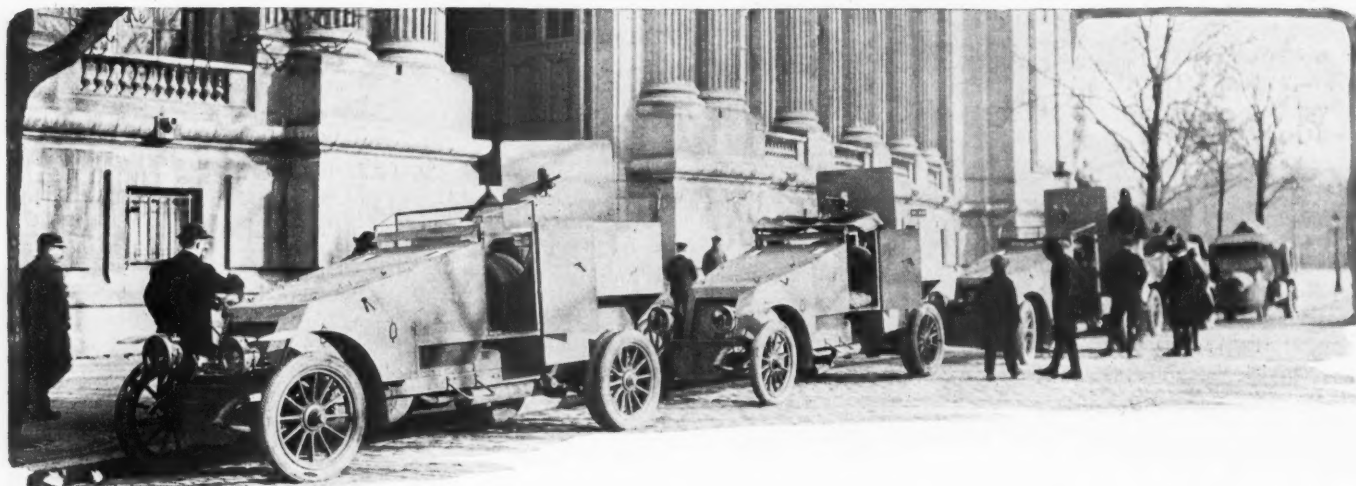
Preliminary to the conference of the federation, P. C. Wolff, secretary of the Federation, was tendered a complimentary dinner recently at the nUnion League by men prominent in Philadelphia motordom.

REO DECLARES DIVIDEND

Detroit, Mich., Dec. 16—Special telegram—The regular quarterly dividend of 2½ per cent has been declared by the Reo Motor Car Co., and will be payable January 1 to stockholders of record December 19.

Renault Builds Armored Cars for the French Army

Details of Construction of Fighting Machines



A FLEET OF RENAULT ARMORED CARS LEAVING GRAND PALAIS, PARIS, FOR THE EASTERN FRONTIER

PARIS, Nov. 28—In common with many other French firms, the Renault company has received an important order for armored cars. The first series has just been delivered and has been taken over by the French naval brigade operating in Belgium along the coast line.

The chassis is the firm's 18-horsepower model having a 3.7 by 6.3 four-cylinder motor. It is mounted on detachable wood wheels with pneumatic tires, twin wheels being used at the rear. With the exception of the change necessary in the rear axle to accommodate twin wheels, the chassis is practically standard. Armor plating protects the whole of the car with the exception of the tires and wheels, which are left fully exposed.

Method of Construction

The method of construction is to place steel ribs at rather wide intervals from frame member to frame member, above the motor and as far to the rear as the steering wheel. Steel plates are attached to this framework by means of bolts and winged nuts. This makes it possible to quickly dismount any plate if it is necessary to examine the mechanism. The housing completely covers both the motor and the radiator, which is behind the power plant, as on all Renault cars.

As will be seen from the illustration the general shape of the Renault bonnet is maintained, but without the angles being rounded off. There is a gap in the forward portion of the housing to allow of air entering, the draft being assured by the flywheel fan. While this general arrangement might appear to be inefficient as regards cooling, it is worth noting that on the latest Renault models, intended to have been produced for the 1915 season, no radiator tubes are exposed, the sides and top of the bonnet being flush with the sides and top of the radiator. The capacity of this latter has been increased.

By W. F. Bradley

While the cooling arrangements can hardly be considered ideal, they ought to be found sufficient for winter work. A steel plate is carried in the extreme front, between the frame members, so as to protect the underpan, which with this system of cooling must be completely air-tight so as to prevent the draft passing otherwise than through the radiator tubes. At the rear there is a similar plate, filling up the whole of the space between the frame members, and giving protection to the axle and differential housing.

The body is a box-like structure with a quick-firing gun pivoted in the center and having a rectangular shield. With the exception of a tool box under one of the overhanging panels on the left-hand side, the whole of the kit is under cover. The steering column is well raked so as to give the driver as low a position as possible. His protection consists of the scuttle dash, which consists of an inclined plane from the front of the motor to the steering wheel, where it is surmounted by steel louvres with a variable inclination. A complete set of spare tires is placed upright at the back of the driver's seat. No special seating accommodation is provided for the gunners. The crew of each car consists of three men.

Germany Well Prepared

No type of car has proved more useful than the armored car. Yet it is this branch of motor application to warfare which had received least attention before hostilities were declared, and on which the army authorities even now possess the least knowledge. Of all the powers engaged in this war, Germany alone seems to have appreciated the armored car; but it was the only power prepared for an offensive war. But even its machine had the disadvantage of having been developed in the

drawing office, and not on the road. The other nations in the war adopted armored cars after the outbreak of hostilities, and when they had seen what Germany was doing.

All Kinds of Cars Used

Every type of vehicle propelled by an internal-combustion motor appears to have been thought suitable for receiving a gun and some armor plating. On the one hand we have the traveling German fortresses, standing 9 or 10 feet high, completely inclosed in steel, and probably weighing 8 or 9 tons, and on the other hand there are ordinary touring cars, taken out of private service, and fitted with a quick-firing gun back of the rear seat, without an inch of protective plating. The German traveling fortresses might have been useful if the high road march to Paris had been carried out during the month of August, according to schedule. It is difficult to conceive of them making any progress on the secondary



FRONT VIEW OF RENAULT ARMORED CAR, WITH RADIATOR COMPLETELY ENCASED

roads which have been cut up by 3 months' war, heavy rains, and some frost. The French touring cars with a gun in the rear might have been useful if the enemy consisted of savage tribes.

Armored cars generally have suffered by reason of their method of design. The artillery services have ordered or taken possession of a certain type of standard chassis, have put a gun on it and put plating around it without paying sufficient attention to the design as a whole. Weight is the enemy. Obviously it is a difficult matter to maintain a low weight if steel plating of adequate thickness has to be carried round men, gun, and mechanical organs to make them proof against rifle bullets and shrapnel.

The extreme type, or traveling fortress, is not suitable for warfare under the conditions pertaining at the present time. It must have first class granite or macadam roads, and even in highly-developed Europe these are not always available. Results up to date show that two distinct types of armored cars should be provided for. The first is a powerful touring car, or even a 2-ton truck chassis, completely incased, but without losing sight of the fact that weight must be kept down. The Belgians have some very good examples of this type of armored car. They have taken their more powerful touring car chassis, with motors of roughly 4 by 6 inches bore and stroke and have built a suitable steel body on them. These machines are not intended to do cross-country work, but naturally they will have to operate on dirt roads and should have a reasonable clearance. In order to keep weight at a reasonable figure, the height should be as low as possible. It is quite possible to give all the protection required for the men and gun without exceeding a total height of 60 inches. The steering column is well inclined so as to bring the driver toward the center of the car, and in as low a position as possible.

There is no difficulty regarding the seating accommodation, for the interior of the body is a single compartment. A roof is not required; while it is dispensed with on most of the cars now in the field, it is considered advantageous to have a partial roof, the center being open for the manipulation of the gun. Many of the Belgian machines have a turret revolving with the gun.

Protecting Motor and Radiator

The motor and radiator must be completely protected. It has been proved that it is possible to do this without interfering with the cooling efficiency. With a correctly designed fan and a slightly larger radiator, enough air can be drawn in to keep the motor cool under the most disadvantageous circumstances. In most cases the bonnet is of such a design that it allows of the easy escape of the hot air under it without allowing shot to enter. There is no necessity whatever to completely inclose the wheels, indeed, to do so

makes the car useless except on perfect roads, yet some protection should be provided. Detachable wheels are an absolute necessity. For war purposes wire detachable types have proved their superiority. On the more heavier armored cars cast steel wheels are proving satisfactory.

Differential Lock Useful

A differential lock is proving to be a valuable auxiliary. It is an obligatory fitting on certain types of French army tractors. The driver of an armored car soon asks for chains for his driving wheels, although he may never have used them in private service. Among the truck types which are being used as armored cars are the London omnibus chassis and French 2-ton trucks. While they are satisfactory as a whole, the bus chassis are unnecessarily big for carrying a single gun and three or four men. Their bulk is further increased by building the body with an overhang, so that it protects the wheels of the vehicle.

The second type of armored machines



FRENCH NAVAL OFFICER ABOARD AN ARMORED CAR

is the light car of the Ford class, with the minimum amount of plating. It is known that the French authorities have had a number of Fords under practical test, and it is quite possible that the order for them will have been placed before this story appears in print. These machines are intended to operate over any kind of road and to do a certain amount of cross country work. The object of these cars is to extend the scope of the machine guns attached to cavalry and infantry regiments. The men who handle these guns carry them over every kind of country, and if the same work is to be done by a motor car, but of course with greater rapidity, ability to pass everywhere must be the main consideration. There cannot of necessity be much plating; protection of the main organs against rifle fire is the utmost that can be expected. Even this is not absolutely necessary. The machine gun sections make

their way without any artificial protection, and the men who handle these cars will not run exceptional risks by doing the same.

Evidently there has been no time to produce the ideal armored car. It may be that plans are in hand, but if so, it will not be known until the completed machine has made its appearance. The four-wheel-drive already has proved its value and should be adapted to armored cars. A machine similar to the light four-wheel-drive tractors, of which the French are now making considerable numbers, would be ideal for this work. The present machine, however, is unnecessarily heavy, for it is designed to pull a useful load of about 6 tons. With the same design, however, and much lighter construction, an excellent fighting machine would be obtained. All on, it need not weigh more than 3 tons.

Such a machine, driven and steered at both ends, could have a speed of 30 to 34 miles an hour, which is ample for war requirements, and would be capable of traveling over any country on which a horse can draw a load. In addition to driving at both ends, it should have duplicate steering, so that the driver has only to turn from one wheel to another to travel stern first. Instead of the six forward speeds now used on these light tractors, there should be four forward and two reverse speeds. This will enable the machine to travel ahead at a rapid pace and will enable it to get out of difficulties from which it would otherwise be inextricable.

Improvements Coming

It is somewhat surprising that a vehicle of this type has not been already produced. Events have moved with greater rapidity than designers. The four-wheel-drive vehicle has only just been perfected, but the French who are responsible for the pioneer work in Europe have not got any further than its application to heavy loads. The double steering car, with a low and a high reverse also has been in use for some time, but only for the purposes of smuggling along the Franco-Belgian frontier.

There are other applications of the armored car to artillery, but they do not come under the category of armored cars. The French, for instance, have some of their heavy guns mounted on special chassis fitted with four solid struts capable of lifting the wheels clear, thus providing a solid platform. Further, many of the 155-millimeter guns are drawn by four-wheel-drive tractors instead of by horses. These, however, are only successful attempts to give greater mobility to artillery than is possible with the use of horses. There is no attempt at armor plating the vehicles. When the tractors have brought the guns into position they are put into a place of shelter in just the same way as horses. They are more easily concealed, however, than animals, and by means of their winches they have the advantage of being able to haul the guns out of a difficult position without actually exposing themselves.

New Regulator and Cutout on Gray & Davis Generators

Centrifugal Governor Abandoned—Two Motor and Two Generator Types

TWO starting motors and two lighting generators with many new features will constitute the Gray & Davis line for 1915. The most important change is that found in the lighting generators, which are now of the variable speed type. Both generators and motors have been reduced in size, the accessibility improved and detail mechanical and electrical changes made in both systems.

The two types of lighting generators are the T, rated to give a current output of 10 amperes at 6.5 volts and 1,000 r.p.m. and the S, which gives 10 amperes at 6.5 volts and 650 r.p.m.

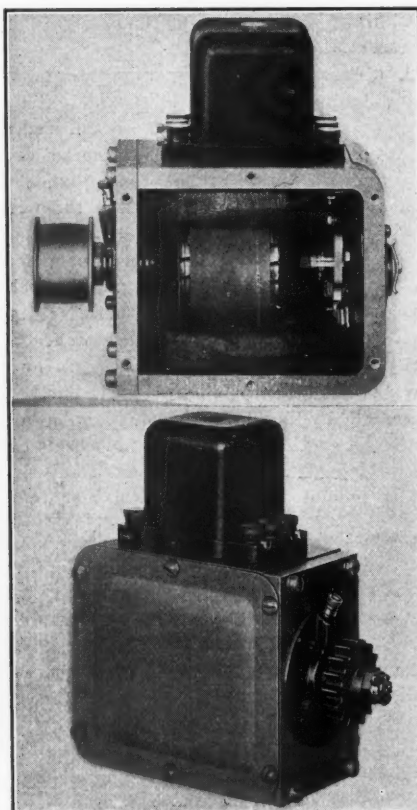
Most important of the changes in the generator is the method of voltage regulation. In the older machines voltage regulation was accomplished by maintaining the speed of the armature constant by the use of a centrifugal governor. In the new machine there is a combined regulator and cutout which rests on the top of the generator and which not only maintains constant voltage regardless of speed variation, but also breaks the circuit when the speed of the generator drops so low that the voltage it generates is less than that of the battery.

Some Constructional Features

The new machines have a frame which is constructed of one flat piece of low-carbon steel formed into a U shape. This change in frame construction gives greater ruggedness, is more compact, allows more accurate alignment of the bearings and the number of parts is reduced materially. Magnetic leakage also is avoided.

The type T generator is intended for four-cylinder cars and is designed to run at approximately two and one-half times crankshaft speed or in short, to be driven at its rated speed at a car speed of about 10 miles per hour on high gear.

The type S generator is for six-cylinder machines and is to be driven directly from the magneto shaft, at one and one-half times crankshaft speed. This gearing allows the generator to run at its rated speed of 650 r.p.m. when the car is driven 10 to 12 miles per hour.



Upper illustration is that of the new type T Gray & Davis generator with the combined regulator-cutout mounted on top of the casing. This generator is designed for four-cylinder cars, while the lower one shown is the type S for six-cylinder

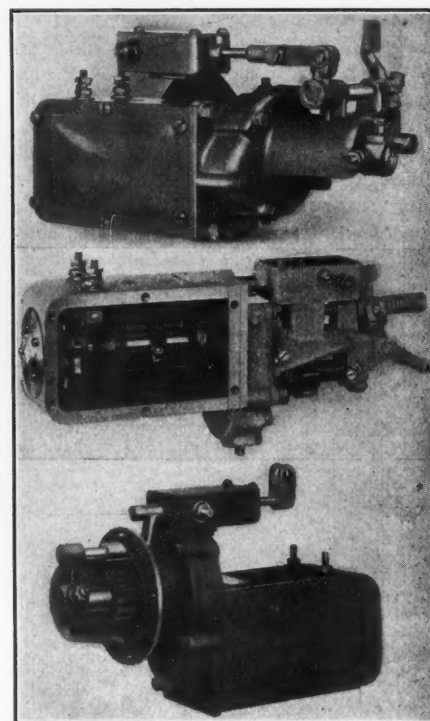
The generators for 1915 are similar in appearance to the type Y cranking motor, being of the longitudinal-yoke design. This construction has enabled the production of the same current at the same speed as heretofore, but with a smaller and lighter machine.

The Type T Generator

The type T generator complete with regulator cutout weighs 20.5 pounds, a reduction of 6.5 pounds. It measures 4.13 by 5.34 by 8.62 inches, while the G-1 generator which it replaces measures 5.5 by 6 by 11.67 inches.

Likewise the new type S generator which takes the place of the type E has been reduced 1.25 pounds in weight and the dimensions reduced from 5.5 by 6 by 12.5 to 4.63 by 5.97 by 10.75 inches.

The type Y cranking motor is a new design, rated at 6 volts, 100 amperes at 2,800 r.p.m. This type is for all but the very large cars. Cars with motors of extreme size will use the type H-1 motor, which was a standard model this year. It carries its full load when operating at 1,500 r.p.m., at which time it draws a current



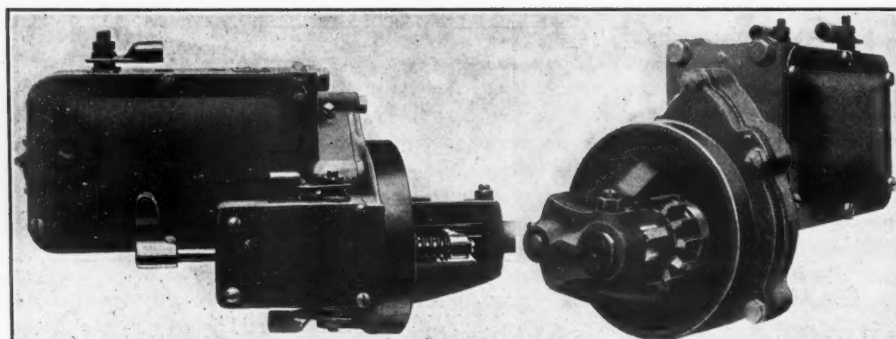
Three types of the model Y cranking motor, the upper being called the 4-68, the center 4-50 and the lower 4-66

of 150 amperes. It operates only on a 6-volt circuit.

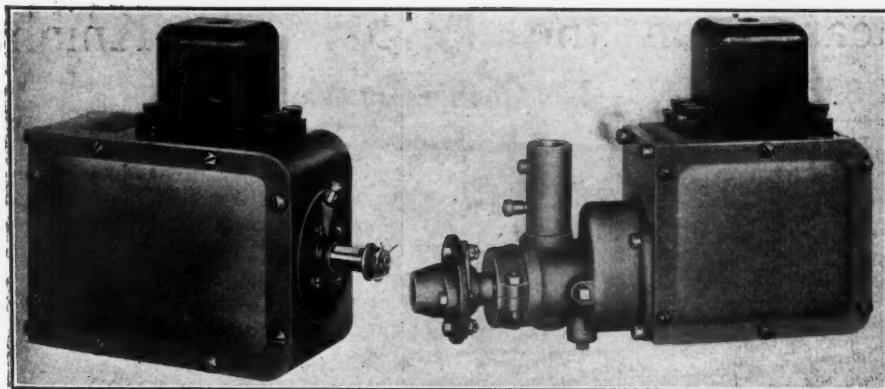
Mechanical improvements in the motors have been directed chiefly towards accessibility and ease of inspection of parts and to the refinement of details to give greater strength. For accessibility, the new Y motor has the longitudinal type of field yokes which readily permits access to the interior of the motor by the removal of the cover plate from the side. The entire interior mechanism of the motor can be reached by removing these side cover plates.

Electrical Improvements Made

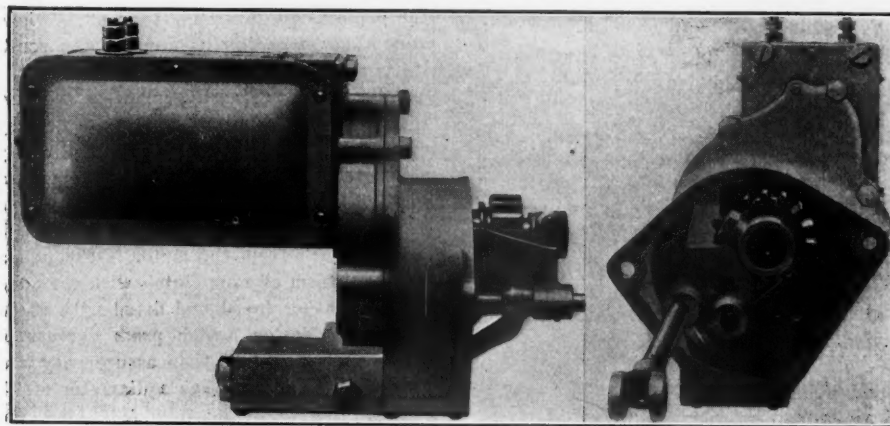
Electrical improvements in the Y motor, the improved model K, have greatly increased the torque and it weighs only two-thirds as much as the type it supplants. The new motor weighs 19.75 pounds and the old one 31 pounds. While the type K



Two types of the type Y motor with side mounting of switch



The left illustration is that of the type T dynamo and that of the right the same type with vertical ignition drive



Two types of the type Y cranking motor of the inclosed type with side mounting of switch

motor was rated to develop normal load at 3,600 r.p.m. with a current draw of 100 amperes the type Y develops the same torque with the same current consumption at 2,800 r.p.m. The type Y motor is 4.312 by 4.72 by 8.16 inches. These dimensions compare favorably with the K motor, which was 5.75 inches in diameter and 8.875 inches long.

Flywheel Drive Standard

For 1915 the flywheel drive will be standard. The speed reducing gears and starting switches are integral with the motor casing and arranged so that a single movement of the starting pedal simultaneously meshes the sliding piston with the

flywheel gear and closes the starting switch.

Under normal conditions the draw on the battery varies from 65 to 110 amperes. Under adverse conditions, such as a cold motor and a chilled battery, the initial kick may be as high as two and one-half times the normal running current, but this maximum draft is only for a fraction of a second.

In all Gray & Davis systems the starting and lighting machines are separate units, although in the special system recently brought out for Ford cars these two are mounted one above the other in a single case. Only 6-volt systems are built and the single wire is standard construction.

QUOTES USED CAR PRICES

Chicago, Dec. 14—The Chicago Automobile Trade Association has issued its third "Used Car Central Market Report." The prices in this issue are based on actual sales in the Chicago territory during July, August and September. Prices on 128 different makes of used gasoline cars and fourteen makes of used electrics are included.

These reports on used cars have met with very general response throughout the country, the only objection thus far offered against the reports being a slight difference in market conditions in various sections of the United States, as compared with the Chicago zone. To correct this discrepancy the association has formu-

lated a plan which now is being put into effect to collect sales data on used cars from different sections of the country, with a view to compiling a national report.

To collect this data the country has been divided into zones corresponding in area with those adopted by the federal reserve banking system, and the trade associations within these zones are being asked for co-operation on the prices for used cars sold in the respective territories. A map showing the division of the country, according to the reserve banking system is used as a basis of the work.

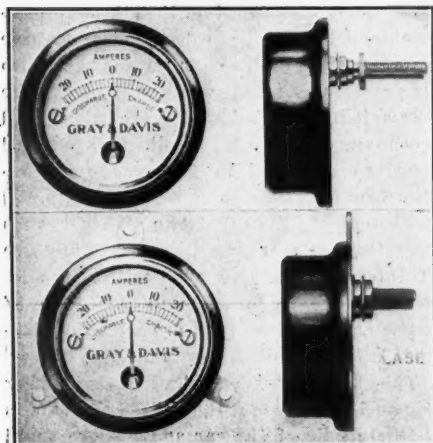
When this step from a local market report to a national one is taken the report pages will be altered. The national report will be in the form of a booklet, 12¼ by 9. In the last column of each page on the national report will be published the "appraised as is value" for the Chicago zone only. This will be the only appraisal made, but a margin will be left in the book so that trade associations using the book can meet jointly and insert their local appraised values. The first issue containing the values as based on the zone system will appear in January and will be based on sales made during the months of October, November and December.

POPE OFFICERS' CLAIMS REDUCED

Hartford, Conn., Dec. 14—Claims of Colonel George Pope to the extent of \$30,153, Albert L. Pope for \$44,537, C. E. Walker for \$30,153, and W. C. Walker for \$26,802 against the Pope Mfg. Co., which has been in the hands of receivers for several months, and, which, under order of the court, were referred to a master, but no hearing ever held, have been ordered reduced by the court with the approval of the several creditors who filed claims. That of Colonel Pope, who is the receiver in the Connecticut jurisdiction, has been trimmed down to \$153, that of A. L. Pope down to \$204, that of C. E. Walker to \$153 and that of W. C. Walker to \$136. In the schedule of claims against the company filed last spring those mentioned above were filed by the officers of the company. It was the contention of the creditors that these claims of the officers of the company should be investigated. Therefore, the claims which aggregate a small fortune have been so far reduced as to be minute when compared with the original claims. The explanation given out here by those who assert they are familiar with the workings of the company now in receivers' hands is that the officers received a commission on all cars sold.

TRADESMAN ELECTED MAYOR

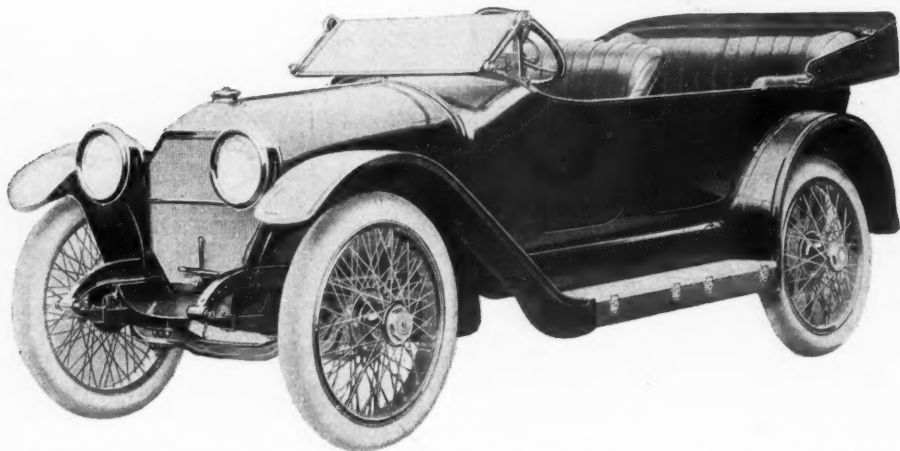
Jackson, Mich., Dec. 8—William Sparks, secretary and treasurer of the Sparks-Withington Co., was today elected mayor of this city by a vote of almost 2 to 1 over his competitors. Mr. Sparks was a representative of the Charter Club, an organization for the maintenance of good government in Jackson.



Ammeters for 1915 Gray & Davis systems. The upper is the stud and the lower the case-supported type

New Body and Gearset on the 1915 Willys-Knight

Price Reduced \$275 to \$2,475—No Changes in Motor



Willys-Knight touring car for 1915 which now sells for \$2,475, a reduction of \$275. It has a wheelbase of 120 inches and the improvements consist of a newly-designed four-speed gearset, a new rear axle housing and a better-appearing body

FOR 1915, the Willys-Knight, product of the Willys-Overland Co., Toledo, O., appears as model K-19 with a new streamline type of body and at a price of \$2,475, which is \$275 under that of the previous machine of this make, model K-17. In the chassis, there are no differences except a change in the housing of the floating rear axle, and the substitution of a new design of four speed gearset. In the motor which is a 4 by 5½ Knight type of standard design, there has been no change.

With a 120-inch wheelbase, the chassis is a substantially-constructed design. The principal specifications include leather-faced cone clutch, four-speed gearset, floating rear axle of worm-drive type, Lanchester cantilever rear springs and 36 by 4½ tires.

Only One Body Style

Only one type of body is fitted to the chassis and in its new form it is of attractive, trim appearance, constructed with steel panels over a wood frame. Doors open to the front with disappearing hinges and the latches operate from inside. Finished in dark blue with ivory stripings, the car has deep Turkish cushions of hand-buffed leather with the front seat cushions adjustable to accommodate the driver in reaching the control pedals.

The motor is of the usual Knight construction with the four cylinders cast in pairs and intake and exhaust ports on opposite sides. The heads are removable.

The Knight design, with which most motorists now are familiar, is that in which no form of poppet valves are used, but rather sliding sleeves, concentric with and outside of the pistons, operate to open and close the passages from the intake and exhaust manifolds to the combustion chambers. When the slots in the upper ends of the two sleeves, one within the other, register with the opening in the casting, there is passage for the gases.

FEATURES OF THE 1915 WILLYS-KNIGHT

Knight motor unchanged

New design of gearset

Body lines improved

New rear axle housing

Cantilever rear springs

These sleeves are reciprocated by means of a shaft which corresponds to the camshaft in an ordinary type of motor. Small connecting rods operate through eccentrics on this shaft to move the sleeves up and down, and are so designed as to cause the slots in the two sleeves to register at the proper time for exhaust or inlet of gases just as the cams in an ordinary motor would raise and lower the poppet valves to give passage to the gases.

In the Willys-Knight design the crankcase is horizontally split into two halves, the upper half carrying the five-bearing crankshaft, while the lower part forms the oil base. Connecting rods are of I-beam section and pistons are of usual form with three concentric rings each.

Silent-Chain Pump Drive

The cooling is effected by a centrifugal pump on the right side of the motor driven by a silent chain. A cellular radiator, mounted on swivel seats to eliminate road jarring so far as possible, is a part of the cooling system. Ignition is cared for by a high-tension magneto, driven through connection to the pump shaft and back of the pump on the right side of the crankcase. It rests on an integral crankcase bracket. This ignition system is entirely independent of the starting and lighting outfit.

It is apparent that in a motor of this design not only the piston bearing surface must be lubricated but the sliding

sleeves as well. A system is employed whereby the oil is distributed by force feed from an engine-driven oil pump directly to the bearings and sleeves. The reservoir is in the bottom of the crankcase and the supply pipe, running along the inside of the case, introduces the lubricant into each of the bearings by an individual lead.

The Cranking System

The combined starting and lighting system is located in the flywheel. The field of the generator of this system really takes the place of the ordinary type of flywheel and when operating as a generator sends its current to the storage battery in the usual way. For starting purposes the current is sent back from the storage battery to the electric unit which, being directly connected to the crankshaft of the motor, readily turns the latter until the engine fires and takes up its cycle of operation.

Drive back from the motor is through a standard form of cone clutch with the cone portion leather faced and fitted with studs under the leather which press against it through springs and thus assure easy engagement. The cone has a diameter of 15 inches.

Located in the center of the chassis and supported by means of four integral arms, is the four-speed selective, sliding gearset. The gears are of heat-treated nickel-steel and constructed in stub-tooth form. Shafts are carried on adjustable taper bearings and the whole assembly is very substantially designed to efficiently carry the power of the 40-horsepower motor. The direct drive is on third speed with fourth somewhat over direct and for use on level going whereby considerable speed can be attained with easiest treatment of the motor.

Drive back from the gearset is through an open shaft fitted with two universals. The rear axle is of floating type and changed over that of the previous model only in the form of pressed steel housing, the internal mechanism being practically as it was. This housing, though more compact and lighter, is so designed as to give greater strength. The car retains the worm drive which has always featured it, the worm being carried under the wheel and continually submerged in oil. Annular ball bearings are used in the rear unit construction.

The car has the usual two sets of brakes operating on rear wheel drums. They are of internal-expanding type with shoes located side by side. Due to this form of brake construction, both are inclosed within the drum against dust and mud.

The Lanchester cantilever rear spring suspension used on the Willys-Knight is characteristic of the car and has the usual attachment at the front and center of the spring to the side frame rail with the rear

end shackled to the axle tube. Due to the length of the rear springs, the car is said to be very easy riding. The rear springs are 52 inches long, while the front semi-elliptics are 38½ inches long. All leaves have a width of 2¼ inches.

Wire Whels Standard

The steering mechanism incorporates a worm and full-gear construction controlled by an 18-inch steering wheel on the left. In accordance with standard practice, control levers are in the center.

Wire wheels are standard equipment. These are of the demountable type and carry 36 by 4½ inch tires on quick-detachable rims. Other equipment at the price includes one-man top with storm curtains, top envelope, one-piece windshield of special design, inspection lamp, engine-driven power tire pump, speedometer driven from the transmission, electric horn, shock absorbers, extra wire wheel and carrier, long tool boxes under running boards, robe and foot rails, jack and tools.

harm might be done to the industry if the interest of the public was not aroused, and it decided to promote a series of three exhibitions, but it very cleverly escaped the "bond" difficulty by arranging that they should be held in the open in the form of rallies to which cyclecar manufacturers should be invited to send their 1915 models.

The invitation met with a very hearty response from the makers, and in all something like 120 new models were sent to take part. The largest muster of any one make consisted of nine A.C.'s, but there were eight Calthorpes and a large number of Morris-Oxford light cars. Among other types noted were the Morgan, Stellite, Horstmann, Lagonda, Victor, Crouch, Hurlinear Humberette, Perry, Swift, Alldays, Mercury, Gamage, G. W. K., Deemster, Jennings, Kennedy, Marshall-Arter, Standard, Winter, Calcott, Whiting-Grant.

The first rally took place on Saturday at the picturesque little town of Hatfield, some 20 miles north of London. Here, despite the unsettled character of the weather, the cyclecars, which were ranged up for inspection in a large field, attracted a great deal of attention, by their imposing appearance. In the afternoon they started for a 40-mile run in procession to Burford Bridge, a popular rendezvous for motorists of the southern counties, passing through London on the way.

Three certificates were offered. The first certificate, for the 1915 model with the smartest appearance, was awarded to a Calthorpe; a second for the new-season model, embodying the most novel features went to a Horstmann car. This model, which despite its Teutonic-sounding name, is manufactured at Bath, embodied many interesting and novel details, that which attracted the most interest being a pedal-operated kick starter. The award of a third certificate, for the 1915 model which had travelled the longest distance to attend the rally has not been definitely decided, but a Morgan three-wheeler which covered more than 125 miles probably will be adjudged the winner.

NEW OVERMAN COMPANY FORMED

New York, Dec. 7—The Overman Cushion Tire Co., New York City, with \$150,000 capitalization, has been formed to succeed the Overman Tire Co., which is in the hands of receivers. The officers of the new company are: President, C. A. Taussig, an attorney; vice-president and sales manager, J. B. Bleiler, formerly an Overman salesman; treasurer and general manager, Max C. Overman, founder of the defunct company; secretary, Alexander Clogher. The company will discontinue the pneumatic tire with which it supplemented its cushion tire and will manufacture the cushion type only. The old company's factory in Passaic, N. J., has been discontinued and the new company is working temporarily in Belleville, N. J., with a New York office and store rooms at 250 West Fifty-fourth street.

English Motor Show Held in a Meadow

Interesting Display of Miniature Cars

LONDON, Nov. 23—In the United Kingdom the term cyclecar is applied to any three or four-wheeled motor vehicle other than a sidecar combination, which has an engine capacity of not more than 1,100 cubic centimeters, and all vehicles coming within this definition, notwithstanding the fact that most of them are constructed in accordance with car practice, and are in fact miniature cars, are under the control of the governing body for motoring—the Auto-Cycle Union.

There is, however, an organization, affiliated to the A. C. U., which caters exclusively for the new motoring, as the cyclecar movement is popularly called in this country, but it possesses no kind of jurisdiction over the movement, and is obliged to confine its activities to promoting competitions, social runs, etc.

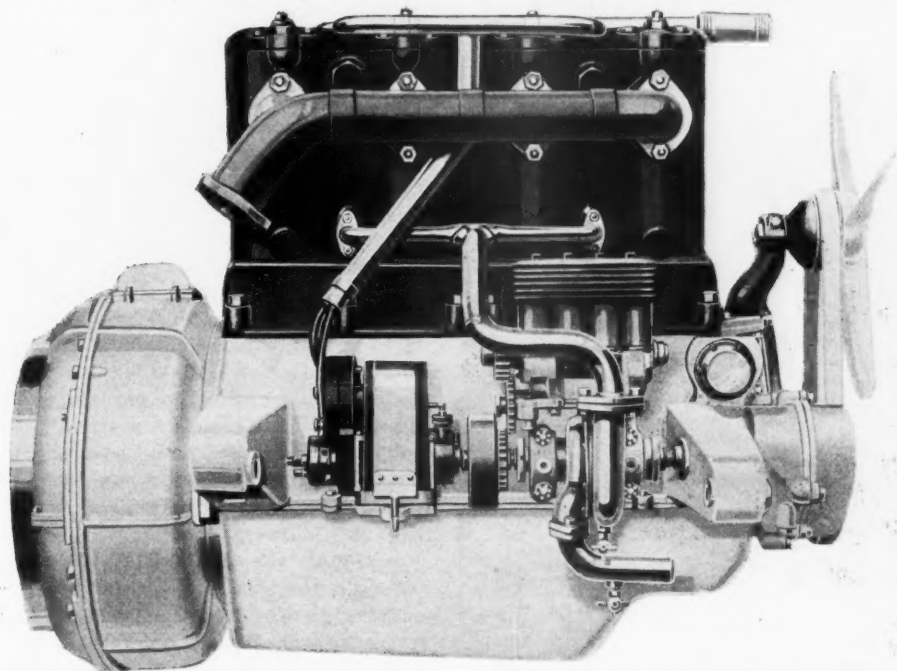
Early this year the club displayed its capabilities for organization, by conducting a highly successful 1-day reliability trial. During the week-end it has shown that it has the confidence of the manufacturers with it, by bringing to a very suc-

cessful issue a scheme which was quite a novelty as far as motoring on this side of the Atlantic is concerned.

In the usual course of events some of the cyclecar manufacturers exhibit their new season's models at Olympia during the car show, and others wait until the motorecyle show which follows it. Owing to the war, the trade bodies have decided this year to cancel both fixtures. Opinion still is mixed as to the advisability of this policy, and the number of manufacturers and traders who hold that something ought to be done to draw the attention of the public to the features of the 1915 models is certainly large.

Every manufacturer who belongs to the trade body has to sign a bond that his cars shall not be exhibited at any show which is not officially sanctioned, and as the Society of Motor Manufacturers and Traders has taken up a threatening attitude to those who have suggested holding exhibitions in private show rooms, efforts in this direction have now been dropped.

The Cyclecar Club was of opinion that



Exhaust side of the four-cylinder Willys-Knight motor showing the water pump and manifolding, power tire pump and magneto with cable conduit. No changes have been made in the design of this power plant

New Six-42 Makes Kisselkar's Fourth Chassis Model

Bodies Have Two, Three or Four Doors—Chassis Design Like the 6-60

FEATURES OF THE NEW

KISSEL SIX 42

Price is \$1,650

Wheelbase 126 and motor $3\frac{5}{8}$

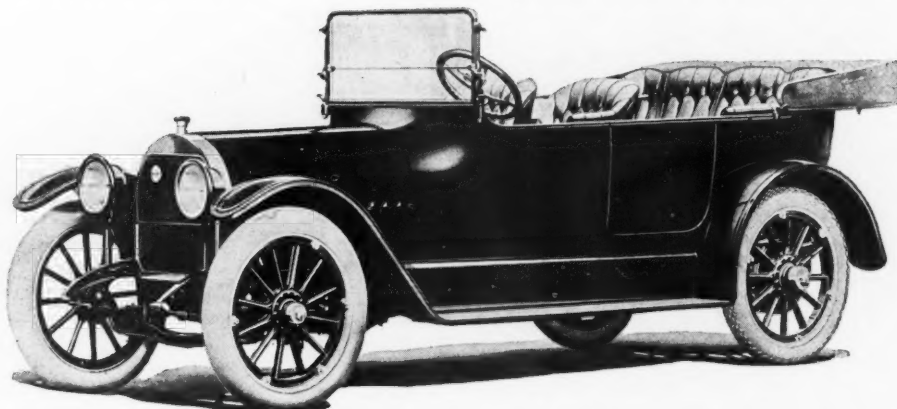
$5\frac{1}{2}$

Westinghouse electric units

Two and three-door bodies

Five body styles on this chassis

Sedan top touring car at \$2,000



Kisselkar six 42, a new model from the Kissel shops. The illustration shows the two-door body one of five types mounted on the new chassis. The price of this car is \$1,650

ANOTHER six-cylinder Kisselkar has been announced by the Kissel Motor Car Co., Hartford, Wis. It is known as the model 42-six, sells for \$1,650, and at this price is fitted with either the two-door body, introduced by this concern this season on its other cars, or the fore-door type. The chassis practically is built in the company's shops and consists of a block-cast L-head, $3\frac{5}{8}$ by $5\frac{1}{2}$ motor, cone clutch and three-speed gearbox in unit, with the motor and driving in the conventional manner to a floating axle. The wheelbase is 126 inches and tires 35 by $4\frac{1}{2}$.

Make Feature of Body Design

The Kissel company makes a strong feature of body design. The one compartment two-door touring body, first introduced in America by this company, is continued with the 42-six, together with the conventional four-door and roadster types and a new seven passenger model with two doors for passengers and a blind door for

the driver on the steering side. The detachable sedan top, a three-passenger coupe and a coupelet body also are featured.

Room for Baggage

Storage facilities are unusually ample, the compartment under the rear seat measuring 43 inches by $15\frac{1}{2}$ inches. Tools are stored under the front seats. The standard color is Kissel blue with gold hair line trimming. All instruments are mounted in a straight line on the dash and illuminated by concealed electric bulbs.

The motor valves are rather large, being $2\frac{1}{8}$ inches diameter. The cooling is by centrifugal pump and oiling by circulating splash, in which a pump takes oil from the crankcase and forces it to troughs under the connecting rods, with proper straining of the oil before being redistributed.

The carburetor used is a horizontal-type Stromberg attached directly to the cylinders near the top and fed by the Stewart vacuum system. A Westinghouse two-unit cranking and lighting system is installed. Ignition also is by instrument of this make.

The cone clutch as with the other parts of the car, is made in the Kissel factory. This clutch has a leather facing with adjustable spring inserts. This unit with the three-speed gearset is part of the unit power plant. The rear axle, a floating design uses Timken roller bearings. Tires are 34 by 4 on the five-passenger and 35 by $4\frac{1}{2}$ on the seven.

Complete Equipment

Equipment includes one-man top, ignition lock, two-tire carrier, adjustable to any size casing, electric horn, etc.

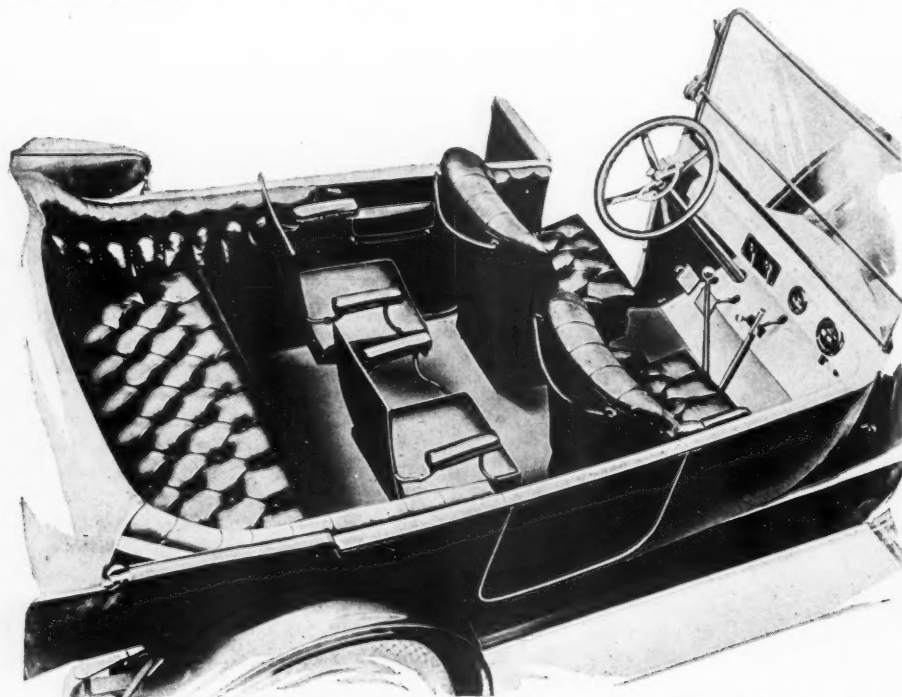
Upon this new chassis are mounted five body styles, a two or four-door touring at \$1,650, a two-passenger roadster at the same price, a seven-passenger with three or four doors at \$1,850, a five-passenger touring with detachable sedan top at \$2,000, and a coupelet at \$1,950.

OVERLAND BUSINESS GROWING

New York, Dec. 14—Statistics of the Willys-Overland Co.'s business made public recently, show a larger volume of sales from July 1 to November 25, than that made during the entire 6 months ended January 1, 1914. Foreign orders for Overland cars received up to November 25 exceeded by 12 per cent those received by the corresponding date of last year, with the unfilled orders for foreign shipment amounting to two and one-half times those on hand on the same day a year ago.

WALTON QUILTS TIMKEN

Detroit, Mich., Dec. 16—Special telegram—Edwin A. Walton, advertising manager of the Timken Detroit Axle Co., has resigned to again occupy the same position with the Burroughs Adding Machine Co., Detroit.



Interior of the Kisselkar six 42 fitted with a three-door touring body. Note the individual front seats and the aisle between. The chassis upon which this body is mounted is in many respects similar in design to the model 6-60

Oakland Co. Brings Out Speedster With Bucket Seats

Built on Model 37 Chassis—Car Has Racy Appearance

FEATURES OF THE LATEST OAKLAND MODEL

Price is \$1,100
Bucket seats for two
Chassis like the model 37
Gear ratio $3\frac{3}{4}$ to 1

A SPEEDSTER model, capable, it is claimed of traveling 65 miles per hour, has just been announced by the Oakland Motor Car Co., Pontiac, Mich. The price of the new creation is \$1,100 and it was designed for the buyer who wants a two-passenger vehicle, racy in appearance and speedy in action. The chassis is exactly the same as the model 37 Oakland with the exception of the rear axle reduction which in the new model is $3\frac{3}{4}$ to 1.

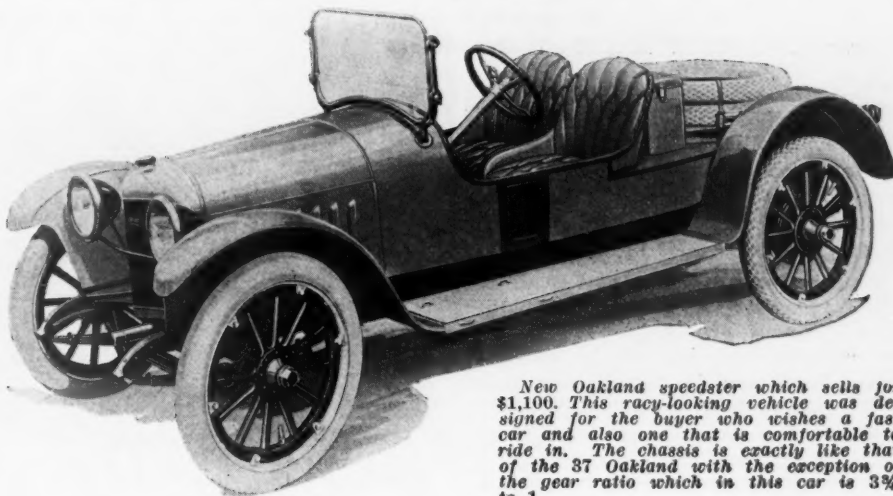
The seats in the speedster are of the bucket type with high backs making for comfort. Behind the seats is a large deck under which is a space sufficiently large to carry tools and luggage while on top of the deck is provision for carrying spare tires.

This car is fitted with a Northway motor, $3\frac{1}{2}$ by 5, equipped with a Delco cranking, lighting and ignition system and Stewart vacuum gasoline feed. The drive is by cone clutch and three-speed gearset to a floating axle. The wheelbase is 112 inches and the equipment includes muffler cutout, dimmer headlights, etc. The standard finish is gray for the body, with red striping and upholstery and black running gear, or yellow body, red wheels and red upholstery and striping.

TRYING TO SAVE HANS CO.

La Crosse, Wis., Dec. 14—D. G. MacMillan, who was appointed trustee of the Hans Motor Equipment Co., La Crosse, Wis., a month ago, has advised preferred stockholders that a working fund of \$25,000 must be raised at once or the corporation thrown into bankruptcy. The concern is a large manufacturer of gauges, pressure pumps and other parts used by several of the leading motor car manufacturers in the United States but has been suffering from the lack of working capital for some time.

The preferred stockholders have made a proposition to John H. Hans, president, and Edmund E. Hans, vice-president and chief engineer, that the \$60,000 common stock they now hold be cancelled; that common stock be issued for the \$62,000 preferred stock now outstanding, and that \$30,000 of new stock be issued. The inclination of La Crosse investors is to save the concern from bankruptcy litigation because the proposition is considered gilt-edge. To facilitate the selling end of the present business, the Hans Sales



New Oakland speedster which sells for \$1,100. This racy-looking vehicle was designed for the buyer who wishes a fast car and also one that is comfortable to ride in. The chassis is exactly like that of the 37 Oakland with the exception of the gear ratio which in this car is $3\frac{3}{4}$ to 1.

Co., with \$10,000 capital, has been organized by Edmund E. Hans and George Hedding.

KALAMAZOO COMPANY GROWING

Kalamazoo, Mich., Dec. 12—According to President F. G. Clark, the Kalamazoo Motor Vehicle Co. will build 200 trucks in 1915. During the first year of the company, which ended in September, the output was twenty-five trucks. President Clark declares that during the second year of the existence of the company it is planned to build 200 30-horsepower, $1\frac{1}{2}$ -ton trucks, similar in design to the first model.

KNOX LOSES ODD SUIT

Worcester, Mass., Dec. 10—By a decision handed down by the supreme court of Massachusetts today at Boston the Knox Automobile Co., of Springfield, loses its suit against the city of Worcester for \$20,000, the price of four pieces of motor apparatus built for the Worcester fire department. The suit was brought by Edward O. Sutton and Henry G. Fiske, trustees of the Knox company. The trouble began in 1911 when Mayor O'Connell, to break a deadlock over the purchase of fire apparatus following the passage of a \$20,000 appropriation by the city council contracted for four Knox wagons.

Chief Wesley N. Avery of the fire department favored two Pope-Hartford and two La France machines, and so he would not sign the contract for the Knox apparatus. The Knox company built the machines. Meanwhile Mayor O'Connell went out of office and Mayor Wright, who succeeded him, refused to accept the pieces of apparatus when they were sent to Worcester. They remained at the railroad yards a month piling up storage charges until they were sent back to the factory. Then suit was brought.

Later the company offered to compro-

mise by asking Worcester to pay for the bodies as there was a chance to sell the chassis. This was refused. In the finding by Judge Braley he stated that while the mayor's signature was necessary to make any contract valid, yet the making of the contract was vested in the heads of the departments as a primary right, the mayor's signature being merely one of approval. No further appeal will be taken by the Knox company.

CALIFORNIA NAMES H. P. FORMULA

Los Angeles, Cal., Dec. 10—P. F. Meekes of the Los Angeles branch of the California state motor vehicle department, returned from Sacramento yesterday afternoon with the formula that is to be used next year for determining horsepower on motors to be taxed in this state. The formula is: Bore plus stroke, times bore, times number of cylinders, times .224. The owner of a long-stroke motor pays from \$5 to \$10 more under this system. Local dealers and prominent motorists are greatly opposed to the new formula, and there is a lot of talk about taking the matter to court to get a decision on what is horsepower.

It is argued that either the state of California lost \$150,000 last year or the motorists are to lose that amount this season.

UNIFORM TRAFFIC CODE DESIRED

New York, Dec. 14—Conferences recently held in this city and Trenton, N. J., by representatives from this state, New Jersey, Pennsylvania, Maryland, Delaware, the District of Columbia and the New England states, point towards the adoption in the near future of uniform traffic regulations there. A commission has been appointed in New Jersey by Governor Fielder composed of J. H. Lippincott, commissioner of motor vehicles, chairman; A. V. Hamburg, president of the Newark board of trade, and G. B. LaBarre, director of public safety of Trenton.

The Readers' Clearing House

SAYS "BUILD GOOD ROADS FIRST" Passable Highways Essential to Further "See America First" Plan

ST. PAUL, Minn.—Editor Motor Age—I have read in Motor Age the article, "See America First, See America Now," but I would suggest that the slogan be changed to "Build Good Roads First, and Build Them Now."

How can one expect to travel and see the beauties of America when the roads are not passable? The tourist goes to Europe because in America we still have poor roads, poor hotel accommodations, and mosquitoes a-plenty. Therefore, build good roads. It has been stated that there are at present 5,000,000 unemployed men throughout the land and plenty of money in the banks, so why not get busy and do something. "Build Good Roads First—Build Roads Now."—J. P. Harling.

OPERATION OF A ROTARY MOTOR Essential Features of the Gnome Seven-Cylinder Engine

Flushing, L. I.—Editor Motor Age—What is the difference between a rotary-valve motor and a motor with revolving cylinders?

2—Does a high-tension magneto generate direct or alternating current?

3—Why is it so essential to have the contact points in a magneto interrupter set so that they are just a certain distance apart?

4—What type of axle is used on the Ford, Abbott and Hupmobile?

5—Does it make any difference what candle-power bulbs are used when wiring up two lamps in series? If connected in parallel would it make any difference?—George Kent.

1—In a rotary valve motor the valves are in the form of cylindrical rods. These rods revolve, hence the name rotary-valve motor. In the revolving cylinder or rotary motor, the crankshaft remains stationary and the cylinders turn around.

By referring to Fig. 2 the operation of one type of rotary valve will be made clear. At the bottom of the illustration is shown the form of valve employed. This cylindrical piece of metal takes the place of the poppet valve and the spring and all the other poppet mechanism. It will be noticed that there are long holes in the shape of slots, S, in this rod.

These holes are called the ports. The rotary-valve motor used in the Speedwell car has two of these pieces of metal, one for the intake and the other for the exhaust. In the poppet motor of four cylinders there are four intake valves and four exhaust valves. In the rotary-valve motor, instead of having eight there are two long rods each with four holes cut out. In other words, the holes in the rods are valves themselves. At D is shown a valve for three cylinders. G is a coupling connecting the two parts. These valves, as stated before, fit snugly into openings in the side of the cylinder, as shown in the other illustration. The one marked I may

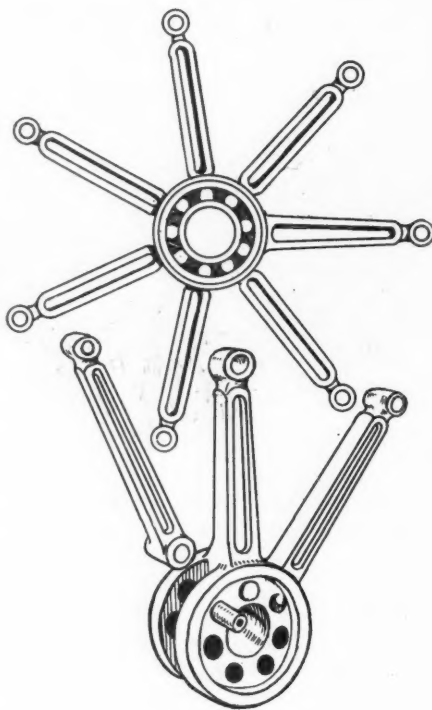


Fig. 1—Showing the connecting rod assembly of the seven-cylinder Gnome rotary motor. Note how the rods are fastened to the bearing retainer by means of pins. The lower illustration shows the crankshaft used in this motor. This crankshaft remains stationary and the rod holder shown above revolves upon the crank pin.

be called the intake and the other marked E the exhaust valve. These rods have gears at their ends and these gears are operated by a chain from another gear on the crankshaft.

This means that the valves turn around when the motor is running. As the valve turns around the slots at some time or other are in line with the combustion chamber and at the same time with the intake or exhaust pipe, as the case may be. Now, as soon as the slot is in line, as shown on the exhaust side of the illustration at B, the gas rushed through the slot and out through the exhaust pipe. If the intake slot of that cylinder is in line then gas will rush into the cylinder just as it rushes past an ordinary poppet valve.

In the ordinary motor car engine the cylinders are bolted to a crankcase and the crankshaft is made to turn around by the force of the explosion on the pistons. In the rotary-cylinder motor the crankshaft is held stationary and the cylinders are mounted on a cylindrical crankcase which can revolve. The rods are fastened to the crankshaft pin by means of a bracket and bearing, as shown in Fig. 1.

When an explosion occurs in such a motor the energy can do nothing else but force the piston down. This action turns the rod holder on the crankshaft, which causes the rods, pistons and hence the cylinder to revolve as a unit. The pistons and connecting rods turn, but since the rods are mounted on a crank and the crank is stationary the pistons will take different positions in the cylinders owing to the location of the rods on the crank pin. By referring to Fig. 3, which shows a section of the Gnome seven-cylinder rotary motor and the pistons with rods mounted, this will be clear. When an explosion occurs the cylinders and rods A, B, C, etc., all turn.

In the movement of the cylinder A from X to Y the piston in the cylinder will travel downward, as shown in the illustration. By the time cylinder A reaches the position now occupied by cylinder E the piston will be almost at the bottom of its stroke. In other words, it is really the cylindrical rod holder shown in Fig. 1 which determines the position of the pistons and this is so because the holder as-

sumes different positions on the crank. The completely-assembled connecting rods and holder are shown on this page and the method of attachment in the lower portion of the illustration.

2—All high-tension magnetos generate alternating current.

3—The distance between the two interrupter points determines the time of break-

Questions Answered and Communications Received

J. P. Harling.....	St. Paul, Minn.
George Kent.....	Flushing, L. I.
J. O. Willis.....	Big Stone Gap, Va.
J. Pachynski.....	South Chicago, Ill.
C. J. Skaggs.....	Eldorado, Ill.
F. Kaspervik.....	Edinburgh, Ill.
A. Reader.....	Cleveland, O.
A. Subscriber.....	New Orleans, La.
J. Smith.....	Beloit, Wis.
J. E. D.....	Chicago
F. B. Rutledge.....	Zanesville, O.
H. Bernard.....	Brooklyn, N. Y.
C. Graves.....	Stockton, Ill.
A. Reader.....	Parsons, Kan.
W. Frank Shook.....	Pittsburgh, Pa.
H. L. F.....	Greenville, Ill.
F. F. Welch.....	Roostingstone, Minn.
J. B. Briggs.....	Waupun, Wis.
J. B. Briggs.....	Waupun, Wis.

No communication not signed with the reader's full name and address will be answered.

ing of the primary circuit. If the points are too far apart or too close the primary circuit will be interrupted too late and too early, respectively.

4—The Ford uses a semi-floating rear axle, and the Hupmobile and Abbott employ a floating type.

5—The candlepower of a bulb does not determine the line in which it shall operate. Six-volt lamps are made for many different candlepower as are lamps of other voltages. When wiring lamps in series, each lamp must have the same resistance as every other lamp, whereas in parallel wiring lamps of various resistances may be placed in the same circuit and each will take current according to its resistance. If you were to take two 6-volt lamps consuming .5 amperes each, and place them in series in a 6-volt line the lamps would burn dimly, because they would be operating at one-half their regular voltage.

HAVING TROUBLE WITH MISFIRING Car Has Not Power on Hills—Apparently Carburetion at Fault

Big Stone Gap, Va.—Editor Motor Age—I have an Overland 1914 model which has been giving me some trouble. It misfires very badly

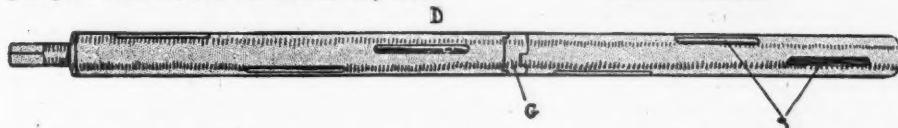


Fig. 2—Type of rotary valve motor with two rods, one on each side of the cylinder. Each rod has six slots for a six-cylinder motor and four for a four-cylinder. The rods are revolved and the slots communicate with the combustion chamber and intake and exhaust manifold as the case may be, thus transferring the fresh or exhaust gas

and hasn't any power to pull on any kind of a hill. I had the carbon cleaned out, the carburetor cleaned, and magneto recharged, but still it will misfire. What is the cause of this trouble?

2—Where can I get a Newton electric horn?
—J. O. Willis.

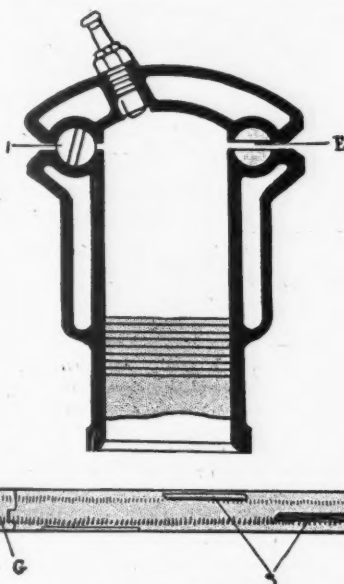
1—If the carburetor is adjusted properly and the magneto timed and adjusted properly, and, as you say, the motor interior clean, the trouble may be caused by poor valve timing, air leaks around the inlet manifold, valve plugs, etc., poor adjustments of the spark plug points, cracked spark plug insulators, or insulation breaks in the wiring. If the misfiring comes from one cylinder all the time it is caused by faulty ignition or poor timing in that cylinder, but if the misfiring is first in one cylinder and then in another you may look to carburetion. Test the cylinders by short circuiting the plug with a hammer head. If you have determined that the trouble is local attend to that cylinder only by removing the spark plug, cleaning it, setting the points and following up all connections. With the misfiring in no specific cylinder all the time seal all joints which are leaking and readjust the carburetor. You say you have removed the magneto. Has it been reset properly and have the wires been connected correctly? Sometimes, unknowingly, the operator will place the No. 1 cylinder wire on No. 2 cylinder and misfiring and backfiring will result.

2—The manufacturer of Newton horns is the Automobile Supply Mfg. Co., 220 Taaffe Place, Brooklyn, N. Y., and if you will write to the company it will give you the name of its nearest dealer.

NUMBER OF BATTERIES TO CHARGE Depends Upon Voltage of Line—a 110-Volt Circuit Will Carry Thirteen

South Chicago, Ill.—Editor Motor Age—Give a diagram of a circuit to charge storage batteries.

2—Is this charging done in series or parallel?



allel? How many batteries may be used with one circuit?

3—Where it is not possible to get direct current, what units would give best results from an alternating circuit?

4—Kindly give the name and address of the concern manufacturing the Combat battery.—J. Pachynski.

1—The illustration in Fig. 5 shows a simple charging circuit with voltmeter and ammeter in place and a rectifier and rheostat in the line. The rectifier is used where the current is alternating. The rheostat is necessary to adjust for different voltages depending upon the number of batteries on charge.

2—The batteries are connected in series on charge and the number of batteries to be charged will depend upon the voltage of the line and the size of the batteries. A 110-volt di-

rect current line, for example, will take care of 15 batteries showing a voltage of 2.5 per cell. But for safety sake only about 13 or 14 are placed in the circuit.

3—You can get direct current by using a motor-generator set, a mercury arc rectifier or a vibrating rectifier.

4—The Combat battery is made by the Commercial Battery Co., 2106 Michigan avenue, Chicago.

Disk Clutch Grabs

Eldorado, Ill.—Editor Motor Age—I have a disk clutch that seems to grab hold when I go into high gear. I have cleaned this clutch and used different kinds of oil, but with no satisfaction.—C. J. Skaggs.

Try using one-third kerosene and two-thirds lubricating oil and if this does not help, spring adjustments may give better results.

Wants to Make Acetylene Torch

Edinburg, Ill.—Editor Motor Age—How can I make a burner for an oxygen-acetylene welding outfit? I have the oxygen tanks and acetylene tanks made, but I cannot get the principle of the burner.

2—Some time ago I asked how to make an electromagnet to recharge magnetos to operate at 110 volts. Has this been answered?—F. Kaspervik.

1—Motor Age does not advise you to make a torch for your oxy-acetylene welding outfit, but instead to buy one. In writing to the manufacturers, names below, mention the size of the tanks you have. Have you installed suitable reducing valves and checks? You also will need a number of different-sized replaceable tips for the burner, which can be bought of the following concerns whose names appear in the

Automobile
Trade Directory:
Dyer Apparatus

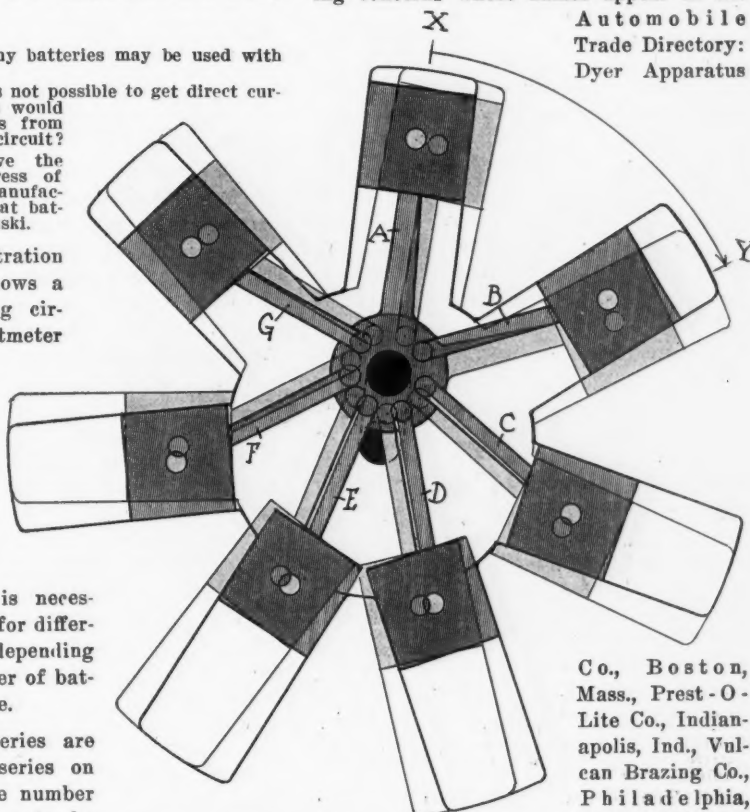


Fig. 3—Operation of the Gnome rotary motor. The central portion holding the connecting rods revolves upon the stationary crankshaft. When an explosion occurs the rod takes the strain. This turns the central portion and causes the rods, pistons and hence the cylinders to revolve

Co., Boston, Mass., Prest-O-Lite Co., Indianapolis, Ind., Vulcan Brazing Co., Philadelphia, Tolman Mfg. Co., Boston, Mass., and the Cox Brass Mfg. Co., Albany, N. Y.

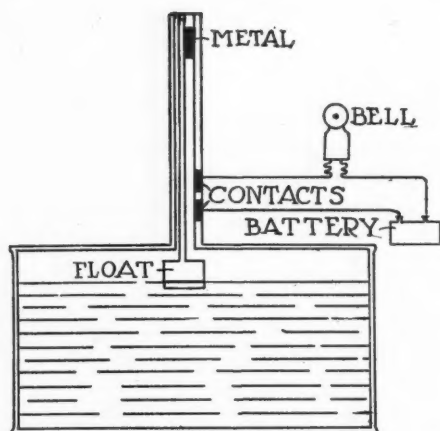


Fig. 4—Fuel tank signal which tells when the level is low. The float rod touches the two contacts and closes a circuit which causes a bell to ring. A criticism of this design is given in the text

2—This was answered in the September 24 issue of Motor Age in this department.

BATTERY CARE DURING WINTER Needs Attention of An Accumulator in Use—Charging Periods

Cleveland, O.—Editor Motor Age—Kindly illustrate with a wiring diagram the ignition, starting and lighting system of the 1915 Chalmers light six, showing the course of the current through the switch and the battery indicator. How does the indicator and the switch work, that is both the starting and ignition switches?

2—What is the best way to care for the battery, if it is not to be used during the winter?

3—What is the speed of the Chalmers light six.—A Reader.

1—A complete description of the cranking and lighting system used on the Chalmers car will appear in one of the show numbers of Motor Age. The first show issue will appear December 31.

2—The best method is to give the battery to the local garageman with instructions to charge it every month or every two weeks and give it the same attention that it would receive if it were in use in the car, such as adding water, etc. If you wish to care for the battery yourself, you can change it every month by the generator in the car. If you have no generator you will have to have the work done by a charging station. The battery should not be kept in the cold garage, a better place being some storeroom in the house.

3—This car will show about 60 miles per hour.

CURRENT CONSUMED BY IGNITION Amount Is Very Small Compared With That Taken By Lamps

New Orleans, La.—Editor Motor Age—When using a six-cylinder engine of $3\frac{1}{2}$ by 5, two 15-candlepower, 7-volt headlights switched on full, one tail light and one dash light, each 4-candlepower, $3\frac{1}{2}$ -volt, what proportion of the total current being drawn from a storage battery is consumed for ignition of the engine?

2—Is the amount of current consumed for ignition constant, or do different engine speeds or different road conditions cause it to vary?

3—What is the approximate saving in current when using the two headlights of this car switched on as dimmers instead of switched on full?—A Subscriber.

1—The ignition system does not take very much current, the total amount being measured in milliamperes. The exact amount required depends upon the resistance of the ignition system.

2—The current consumed varies slightly

because as the compression increases, due to throttle opening, the resistance to the current becomes greater. The difference in current consumption at 200 and 900 r.p.m. would be exceedingly small and would require delicate instruments for measurement.

3—All depends upon what type of dimmers you are using. In some, the dimmer

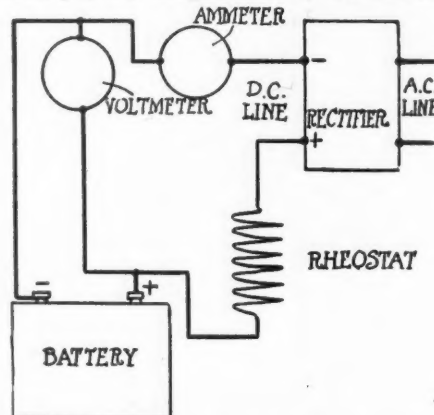


Fig. 5—Method of charging batteries. This shows the location of an ammeter, a voltmeter and rheostat for current control

bulbs take anywhere from one-half to one-fourth the current that the large bulbs consume.

MITCHELL MODEL H VALVE TIMING When Intake and Exhaust Valves Should Open and Close

Beloit, Wis.—Editor Motor Age—Kindly inform me how to time model H, Mitchell four. I do not know what year it was built, but it has the overhead exhaust valves and cages in the cylinders. I have had considerable trouble in getting the engine timed correctly. The motor fires on 1-3-4-2.

2—How is the gas and air adjusted in the H. A. No. 3 Stromberg and the Schebler model O carburetors?

3—What is the best and easiest method of timing the valves of the 1913 and 1914 Ford cars?—J. Smith.

1—The model H is the four-cylinder 1908 Mitchell. The intake valve should open 10 degrees after the piston has reached top dead center and close when the piston has reached bottom dead center. The exhaust valve opens 25 degrees before the piston reaches bottom dead center and closes 5 degrees after the piston reaches top dead center.

2—The Stromberg model H was described and illustrated in Motor Age issue of November 19, page 27. The adjustments of the model O Schebler were given in the October 29 issue of Motor Age, page 29.

3—If the camshaft has been removed its replacement is an easy matter. The camshaft gear has a punchmark upon it and this mark should coincide with another on the crankshaft gear. The tappets are not adjustable and hence if they become worn they must be replaced with new ones or the valve stem must be heated and drawn out to make the clearance correct. The best method is to get new tappets.

Trouble With Cooling System

Stockton, Ill.—Editor Motor Age—Kindly explain the circulation of the water through the motor of a 1912 Everitt six.

2—Is there any chance of one cylinder being cut off from the direct circulation so the cooling would be thermo syphon?—C. Graves.

1—The Everitt six cooling system employs a centrifugal pump which forces the water through the cylinder jackets. After it has circulated around the cylinders it goes to the radiator, where it is cooled and sent again to the pump for circulation.

2—While it is possible that only one cylinder be cut off from circulation, it hardly would be expected that such be the case. The failure of the water pump will convert the system into a thermosyphon and as long as the pump is operating it is forcing water into the jackets. If you will tell Motor Age just what trouble you are having, giving all the symptoms, perhaps more information can be given.

SUGGESTS PORTABLE EMERY WHEEL Would Operate It From a Flexible Shaft Attached to Motor

Chicago.—Editor Motor Age—The illustration in Fig. 6 shows a simple means of using an emery wheel in inaccessible places. The apparatus employs an electric motor, to which is attached a flexible shaft such as is used for driving speedometers. At the end of the shaft is the emery wheel. This device can be used for grinding down parts after they have been assembled and placed in some out of the way position. It also can be used for grinding down parts which are heavy and away from the bench and still does away with the necessity of carrying a portable electric motor with the emery wheel on the armature shaft. The motor may be attached permanently to the work bench and the flexible shaft may be made long enough to reach the desired parts.—J. E. D.

SIGNALS WHEN THE FUEL IS LOW Device Tells Driver That Tank Is Nearly Empty—Some Objections

Brooklyn, N. Y.—Editor Motor Age—I have thought of a device which automatically will tell the driver of a car when the gasoline level in the tank has dropped too low. It consists, as shown in Fig. 4, of a float on a rod operating in a guide on the inner wall of which are two metal contacts which are wired to a bell circuit as shown. The float rod has a single large metal piece almost twice as long as the two contact pieces. When the fuel in the tank drops very low the float will drop and when the metal piece on the rod touches the two contacts the circuit is closed and the bell starts to ring. I see nothing wrong with this device and will appreciate any comment you make.—H. Bernard.

There is one objection which apparently is a serious one and that is, there is a possibility of arcing at the contact points. This might cause trouble, owing to the fact gasoline vapor is present in the small tube in which the float guide operates. Another troublesome point appears to be in the fact that when the fuel level is low, but not low enough to cause bell ringing, and the car is going over a rough road the inequalities in the level may cause the bell to ring at the wrong time. It will be hard to get the float to operate freely and at the same time have the large metal piece make good contact with the two terminals.

Waterproofing the Top

Zanesville, O.—Editor Motor Age—Is there any preparation which can be used to keep the water from coming through a mohair top on a Cadillac touring car?—F. B. Rutledge.

Boiled linseed oil rubbed into the material is the best substance which Motor Age knows for waterproofing the top. Perhaps some readers know of other liquids which will do the work with success.

KNOCKS DESCENDING A GRADE Hard to Tell the Cause—Loose Flywheel Flattened Bearing Ends

Parsons, Kan.—Editor Motor Age—What might cause knocking in a Ford car, when the latter is descending a hill and the spark is fully retarded?—A Reader.

The question is rather broad as you do not state whether the knock is one from the motor or whether it is coming from the rear end or gearset. If in the motor, it may be caused by the looseness of some part. The bearing ends may be flattened, causing the crankshaft to move back and forth slightly. There may be excessive play in the driving mechanism, causing slapping back and forth of the clutch unit. The flywheel may be loose. If you will give Motor Age more definite information concerning the location and characteristics of the knock no doubt the direct cause may be ascertained.

SEMI-FLOATING AXLE ADVANTAGES Allows of Good Wheel Alignment—Weight, Bearings, Etc., Considered

Pittsburgh, Pa.—Editor Motor Age—In order to settle an argument, will Motor Age kindly give me its opinion on the following:

1—If the one rear wheel of a car is jacked up, and then a mark put on the universal, so that it can be watched, and the rear wheel is then turned around, is the gear ratio given the correct ratio? In other words, if a car is geared, say 4 to 1, and the wheel is turned around once will the shaft turn four times? Or, will the fact that the one gear in the differential not moving cause a drag and therefore give a wrong ratio?

2—What are the advantages of a semi-floating axle over the floating?

3—In which type of axle is the wheel most likely to come off in case of accident, or breakage? Will the wheel come off if the axle is broken on a three-quarter floating?

4—What are the advantages of ball over roller bearings and vice versa? What is meant by annular?—W. Frank Shook.

1—The ratio with one wheel jacked up will not be the correct ratio because there are two reductions to be considered. When turning the wheel, the first reduction is between the shaft bevel and the spider bevels and the second between the ring gear and the driving pinion. The correct ratio can be obtained by jacking up both wheels and turning both of them. Why not try this on your own car? Jack up one wheel, place the gearshift lever in direct and then turn the one wheel which has been jacked up.

2—The adherents of the semi-floating type of axle claim that this type is simpler in construction, lighter in weight and therefore easier on tires, and it causes the wheels to run truer. The latter is true, it is claimed, because in the floating axle the bearings are excessively overloaded when skidding, this overload being as high as 475 per cent. Another advantage claimed for this type is that any yielding of the outer end of the axle housing does not affect the alignment of the outer bearing and that shaft alignment is much easier to obtain and to retain. The semi-floating axle allows of smaller bearings being used

than the floating and if the same sized bearings are used in both axles the semi-floating will have the greater safety factor.

3—In the semi-floating axle, should the shaft break in the middle, the wheel will come off in a short time, while in the floating it will take a longer period. In a three-quarters floating axle the wheel is more likely to come off than in a floating because the shaft is rigidly attached to the wheel hub.

4—There are many types of ball and roller bearings. Name the types which you wish discussed. An annular ball bearing is one with the balls mounted between two rings. Annular means in the form of a ring.

HOW HE REPAIRED CARBURETER Motor Choked Before Work Was Done— Float Was Lowered

Greenville, Ill.—Editor Motor Age—I sent my carbureter, a Kingston, a remarkably good puller, but which has begun to overheat the engine on account of worn needles and valve seats, to the factory for repair. When it came back the engine behaved exactly as Subscriber describes in the December 3 issue of Motor Age, page 29. I consulted various repair men, who did nothing but examine the ignition, sell me new accessories thereto, look wise and make charges, without any improvement.

I took the carbureter apart and found that the factory people, probably allowing for a little saturation of the cork, had set the float, a circular cork one, so that when the float needle was closed the float itself was not horizontal, but pointed downward from the fulcrum at an angle of something like 5 degrees. I raised the float, but overdid the job, getting it just a little above the horizontal. The engine would then overload itself with gasoline and choke when the throttle was opened suddenly and wide. I then lowered the float gradually until I have it about 1 degree below the

horizontal. It is not as good on hills as it was before it was repaired, but much better at idling and slow running and no amount of mishandling of the throttle will choke it, except when cold. It is also lighter on gasoline consumption.

To sum the matter up, the cause of the condition described appeared to be that the float level being too low, the suction of the engine could not raise enough gasoline through the spray nozzle, no matter what the adjustment. The level of the Kingston float has to be altered by bending. I do not know about the one Subscriber has.—H. L. F.

MAGNETO WON'T CHARGE BATTERY Ford Instrument Requires a Rectifier— Current Is Alternating

Rollingstone, Minn.—Editor Motor Age—Can a Ford magneto be used to charge a storage battery, if the car is equipped with dry cells for ignition? Would this harm the magneto in any way?—F. F. Walch.

1—The Ford magneto cannot be used to charge a storage battery unless a rectifier is placed in the circuit. The current from a Ford magneto is alternating and only direct current can be used to charge a battery. The only maker Motor Age knows of a battery charging outfit which uses the Ford magneto, is the American Battery Co., 1132 Fulton street, Chicago. It would not harm the magneto to use the current for battery charging.

STEEL WHEELS ON GRANT'S CAR These Are Used on Right Side Only— Wooden Ones on Left

Waupun, Wis.—Editor Motor Age—I noticed in the December 3 issue of Motor Age a statement, in connection with the Corona road race report, to the effect that Grant used steel wheels on his Sunbeam. Automobile stated that he used steel and wood wheels. Which statement is correct?

It seems to me that with the extra load under the car with the tanks it has that he must have used wood rear wheels and steel front wheels. I hardly believe that a steel wheel would break unless in a severe collision. Had he been using wire wheels probably both wheels would have gone under him.

The steel wheel, I believe, will be the standard wheel in the future, and I am sure the day will come when the motoring public will demand them, as they are safer than wire or wood.—J. B. Briggs.

The Sunbeam cars driven by Grant and Babcock at the recent Corona road race used Sankey steel wheels on the right side and wooden wheels on the left side.

Obtaining Better Scavenging

Emmetsburg, Ia.—Editor Motor Age—I have a Chalmers 1912 model, the motor of which does not scavenge thoroughly. What does Motor Age think of porting the cylinders in a large motor? I have done this with a Ford and numerous motorcycles and found it to be very satisfactory.—A Reader.

It would help on the larger motor. If you can possibly use larger exhaust valves and cams which hold the valves open for a longer period you will obtain still better results.

Users of T-Head Motors

Waupun, Wis.—Editor Motor Age—What company builds a motor with the valves on the left and right instead of all on one side?—J. B. Briggs.

You refer to T-head motors. Such motors are used in one or more models of the following cars: Apperson, Austin, Case, Locomobile, Mitchell, Marmon, Peerless, Pierce-Arrow, Pilot, Republic, Simplex, Stutz and Touraine.

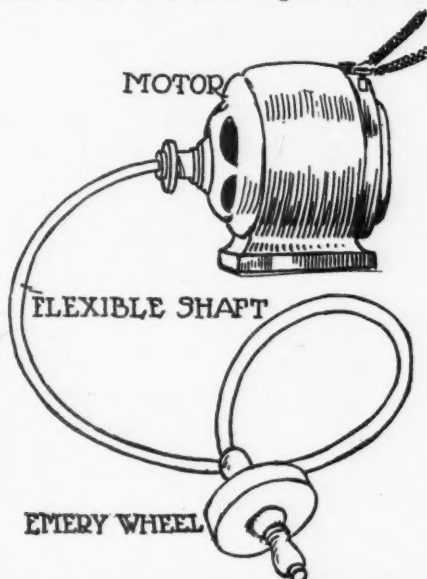


Fig. 6—Reader suggests a flexible shaft attached to electric motor for operating an emery wheel.

The Motor Car Repair Shop

Steep Grade Stops Fuel Flow

A STUDEBAKER 30 recently was being driven through the state of California and during the trip an exceedingly steep grade was encountered, the angularity with the main road being said to be 40 degrees. The car attempted to ascend the grade, but was halted by intermittent firing, coughing and finally stoppage of the motor. This action was caused by the ceasing of the fuel flow, the tank being under the front seat. The driver, however, in order to continue up the hill and avoid turning around or reversing in the narrow road, attached an ordinary bottle to the end of the gasoline feed line, first filling the bottle with gasoline. It was thought the bottle could be held high enough to give the proper head, but it was discovered the fuel would not flow owing to the fact there was no air pressure on the gasoline in the bottle. Accordingly, the driver attempted to break the bottle, so that there would be an opening at the top and the attempt was successful. The illustration in Fig. 2 shows how the car continued on its trip up the hill. The Studebaker in question was an old model, the recent ones being fitted with cowl tanks, which afford a head of gasoline even on steep grades to give good fuel flow.

Watch the Gearcases

Grease or very heavy oil in the gearcases at this time of the year means noisy gears and excessive wear. During the cold weather gearcases packed with grease will cause the gears to run practically without lubrication because the grease sticks to the walls of the housing and little if any ever gets to the gear teeth. The writer had occasion a few days ago to examine the differential housing and gearset of a car and found that the gears were running dry and had been for many weeks because the thick oil had stuck to the case. However, it was extremely difficult on the car in question to remove the differential case cover and in order to keep the gears lubricated a little kerosene was poured into the housing and in addition a pint of cylinder oil. The latter lubricant seems to be good for cold weather use, as when it does thicken it becomes gelatinous and not hard. The use of an oil of light body also will show a power gain because there is not so much load on the gears.

The examination of the gearset is not a difficult matter and at this time of the year every owner should flush the case with kerosene and fill to level with oil.

Sufficient Play in Steering Knuckles

Play in the steering knuckles due to a worn king pin or worn knuckle yoke may be taken up by reboring the yoke and fitting bushings. Much front wheel play

and wobbling is caused by looseness in this joint. The reboring of a set of knuckles will cost anywhere from \$4 to \$15, depending upon the size of the car and the workman to whom it is taken. The portion to

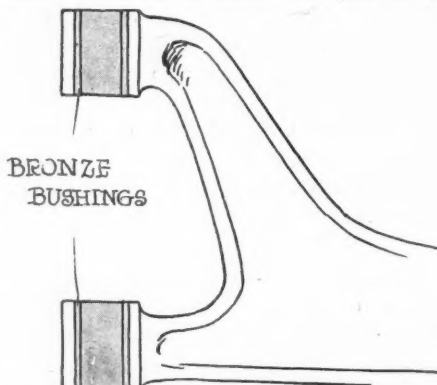


Fig. 1—When the front wheels begin to wobble and the tires wear very rapidly, the trouble often is caused by excessive wear of the king pin or steering knuckle yoke. In such cases bronze bushings may be used effectively as shown above. This method is in use in a number of high-class service stations in Chicago

be rebored is shown in Fig. 1. The bushings are to be of bronze preferably or some similar soft metal.

Initial Starting

When a car is left in a cold garage over night the motor should not be expected to fire the moment the engine is turned over unless the mixture is rich enough for the temperature. Without a sufficiently rich mixture the engine may be turned for some time without good results. A primer of some type becomes a valuable asset at this time of the year, even though an electric cranking motor is installed. The

for its operation, so it becomes a very important matter that the battery be watched carefully. During the colder weather batteries do not show the efficiency that they do in the warmer temperatures and the owner can assist the battery materially by turning the engine over a few times with the hand crank before the starting motor is thrown into operation. The cranking by hand is a means of freeing the gelatinous oil around the pistons. The thickening of the oil will very soon show that extra power is necessary to turn the engine over. A warm motor is much more easily cranked than a cold one and when the electric system is used to do the cranking it means less current is consumed in the former case.

Study Accessory Adjustments

There are quite a number of drivers who are unfamiliar with the accessories on the motor. The carburetor, for example, must be understood fully before any attempt is made to make adjustments. Not a few car owners have written to Motor Age asking how this or that carburetor may be made to feed more gasoline and less air at slow speed, so that a richer mixture can be obtained for cranking. The very first thing any owner should do when he receives his car is to make a study of the various adjustments. Every carburetor maker, every magneto manufacturer, the car builder, all issue instructions on the method of making various adjustments and these should be studied. Without knowing the simple adjustments, a tour of any length, especially in the winter months, may mean considerable trouble on the road.

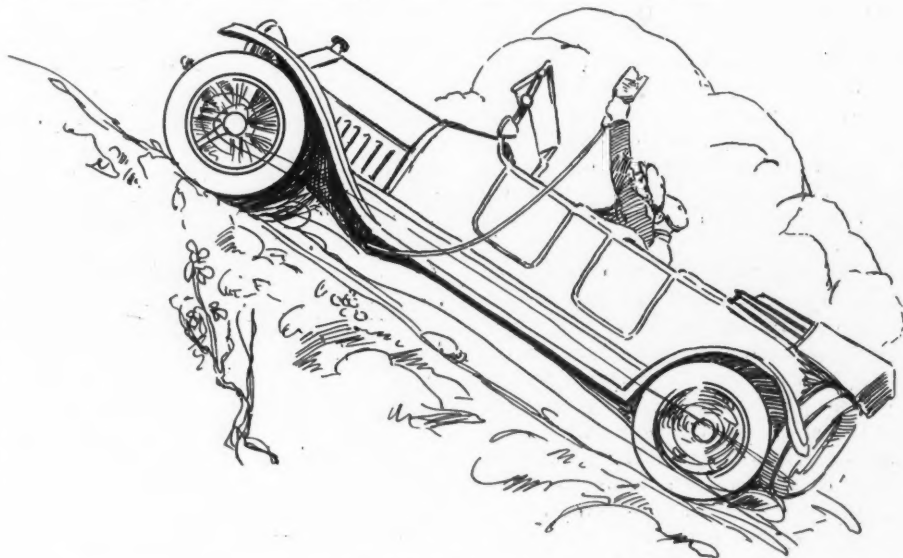
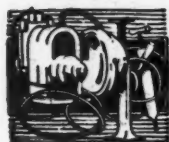


Fig. 2—How a California motorist ascended a very steep grade after the fuel from the tank stopped flowing to the carburetor. The grade was so steep that the fuel would not feed by gravity to the carburetor. A bottle was taken, the top broken, and the feed line attached to the mouth as shown, so that by holding the bottle high in the air sufficient head was obtained



The Accessory Corner



Denver-Ford Mechanical Cranker

A MECHANICAL engine cranker for Ford cars, operated by the pulling of a handle on the dash, is being manufactured by the Denver Ford Starter Co., Denver, Colo., and sold for \$15 complete. This cranker essentially comprises a special fan pulley, which is mounted on the end of the crankshaft and the pulling of the handle on the dash causes a wrench-like portion to grip the pulley and turn it around, thus cranking the motor. The parts of this system are shown in Fig. 1. The cranker frame FI is attached to the car frame by the forward fender bolts. The special fan pulley B is attached to the crankshaft and the rod E extended to the dash, where it is attached to a suitable handle. When the latter is pulled the portion C grips the pulley and turns it around sufficiently to start the motor in operation, it is claimed. After the motor has started firing the handle is released and the spring D returns the grip C to normal position, thus freeing the pulley. The total weight of the Denver is said to be 10 pounds.

On-and-Off Tire Tool

A two-part tire tool, which makes tire removal and application an easy matter, it is claimed, is being marketed by the Stewart Accessories Co., Detroit, Mich. The main feature of this new tool is that the energy of the tire as it is being revolved by the hand is used to free the bead from the rim. The handle of this tool has a tapered end which is forced between the tire and rim to affect an opening for the main portion of the tool. This action is illustrated in Fig. 2, at the top. After the tool itself has been slipped into position the handle is removed from its original place and inserted into an opening in the top of the tool, as shown at the



Fig. 2—New tire tool called the On-and-Off. This tool uses the energy of a revolving wheel to free or insert the tire bead

bottom of Fig. 2. The handle is made to rest against the wheel hub and by revolving the tire with one hand and steadying the handle with the other the tire is removed. This is caused by the end of the tool striking the ground and holding, so that the movement of the wheel forces the tool to free the bead all around. The tool is used almost in the same way as mentioned for replacing a tire. The price of this tool is \$1 and it is made of malleable steel.

New J-M Clocks

The H. W. Johns-Manville Co., New York, announces two new 8-day clocks, one for flush mounting and the other for ordinary dash attachment. Both winding

key and setting knob are permanently attached to the movement, which is of the lever-escapement type. The case into which the movement fits is said to be moisture and dustproof. There is still another covering into which the movement unit fits and by a quarter turn, the entire mechanism may be removed or replaced. Three finishes are offered, black and brass, nickel, or gun metal, with either black numerals on white porcelain, or white figures on black dial.

Hick-Meyer Deflector

A Toledo, O., concern, the Hick-Meyer Deflector Co., has brought out a simple device for obtaining proper illumination of the road and at the same time eliminating the troublesome glare, an inherent fault of ordinary high-candlepower headlights. The Hick-Meyer is in the form of a steel cup shaped so as to fit closely to the lower half of the headlight bulb. The inner surface of this cup is polished. When in use the light from the bulb is said to be kept below a 4-foot level, extending forward from the top of the lamp, thus giving light sufficient for driving and not blinding the drivers of oncoming vehicles. The device installed is shown in Fig. 3.

Micro Piston Ring

The Micro Piston Ring Co., 1960 Broadway, New York, has introduced a type of ring which is designed to prevent the leakage of mixture and oil past the piston.

The Micro ring consists of a main ring, with interfitting stepped joint and a plain-jointed auxiliary ring. The main ring, eccentric and slightly larger than the cylinder, has its outer or bearing surface uniformly channeled throughout to receive the snugly fitting auxiliary ring, which also is of larger diameter than the cylinder and is of practically the same uniform section as the channel. By placing the joints of the two rings diametrically opposite, the outer ring seals the opening in the inner ring, and the two rings together expand against the cylinder wall.

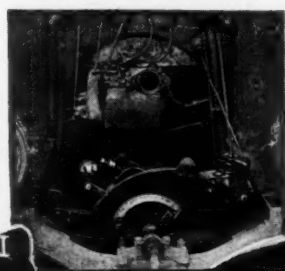


Fig. 1—Denver-Ford mechanical cranker which requires only the pulling of a handle on the dash for turning over the motor. The cranker installed also is shown

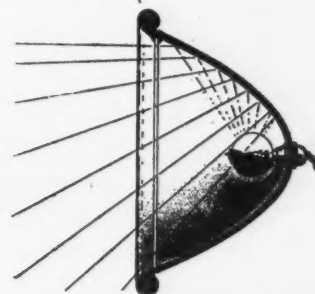
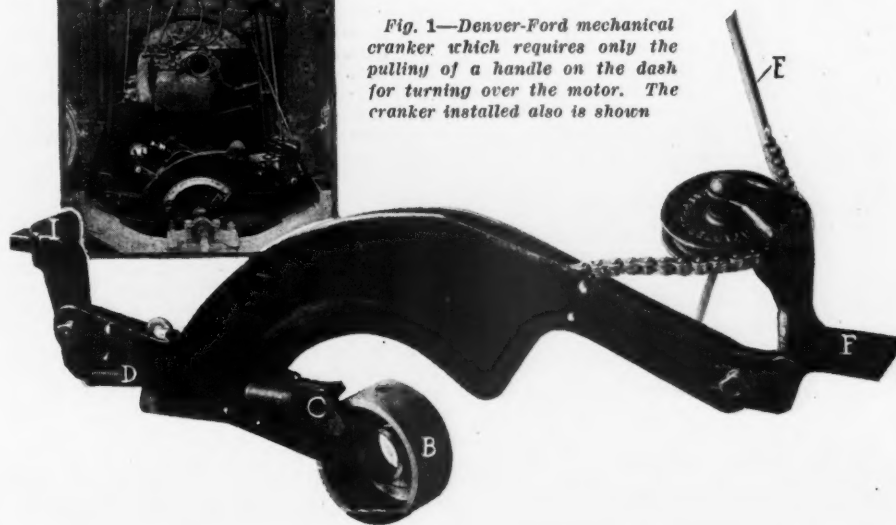


Fig. 3—A new deflector called the Hick-Meyer which is in the form of a steel cup shaped to fit the lower half of the bulb. The inner side of the cup is polished



From the Four Winds



FIRST Car Sent Through Canal—A new epoch in western motor car distribution was reached last week when the first car shipped to the Pacific coast by way of the Panama canal was sent from Philadelphia to Y. R. del Valle, San Francisco. It was a Vim light delivery truck.

Green Bay to Have Club House—Unless present plans miscarry, the Green Bay Automobile Club, organized during the past season by motorists of Brown county, Wis., will have a splendid country club home by the beginning of next season. It will be situated on the shores of Green Bay, Lake Michigan, a few miles from the city limits. A holding company has been organized by the officers and directors of the club to purchase the Red Banks hotel property and a large surrounding acreage and the hotel will be remodeled for clubhouse purposes. The grounds will be regraded and equipped with a garage and shelter.

20,000 Cars for Colorado in 1915—Twenty thousand motor cars for Colorado in 1915 is the estimate made by Secretary of State James B. Pearce, who has just received his first consignment of license tags for the new year. The order calls for 19,000 regular tags and 1,000 dealers' tags. The total registration so far for 1914 is estimated at close to 19,000, but complete reports have not yet been received from the outside counties. The 1915 tag is of medium yellow tint, with figures and letters in black, and is easy to read at a reasonable distance.

New Roads in Crater Lake Park—In his report of conditions in the Crater Lake national park for the season just closed, Superintendent G. W. Steel says that at the close of September 7,096 visitors had registered, as against 5,826 at the same time in 1913. Of the visitors 5,781 registered from Oregon and 932 from California. Several years ago congress set aside the sum of \$700,000 for a road system in the park. It was put on the continuing contract basis. An appropriation of \$125,000 was made for use during the season of 1913 and \$85,000 for 1914. Under these appropriations grading and draining have proceeded steadily, resulting in a new road from the Klamath entrance to the rim of the lake at Kerr Notch, a distance of 6½ miles. The Rim road from Crater Lake lodge to a junction with the Pinnacles road and from Kerr Notch to a point a little beyond Sentinel Rock also have been completed.

Seattle Motorists Up in Arms—Motor car owners of Seattle, Wash., are greatly wrought up over the new law passed by the city council regulating the lighting of motor vehicles because, it is contended, the ordinance is barren of any beneficial provisions. It has been the subject of much bitter criticism inasmuch as it gives policemen sole discretion as to what constitutes a "blinding" or "dazzling" effect. A similar system was tried out in Seattle several months ago and the opinions of the policemen were so widely varied that motorists were in constant confusion and the plan was temporarily abandoned. Now it has been re-enacted into law. The new law requires that not more than two white lights shall be fastened to the front of car and that the projecting light shall be clearly visible on the surface of the roadway at least 60 feet ahead of the machine. It is further provided that no light shall be less than 8 candlepower and that the rays "shall not be glaring, daz-

zling or blinding." The maximum penalty is \$100 fine or 30 days in jail. The regulations governing the period during which cars may be parked in the business district also were changed by the city council. A limit of 30 minutes has been placed on stops in the main thoroughfares during the daytime.

Liverymen Boycott Motor Hearse Owner—Because he became progressive and invested in a motor hearse, J. B. Winzeler, a Peoria undertaker, has been boycotted by a firm which has been supplying him with carriages for funerals. When the motor hearse was first received, the liverymen secured his pledge not to use the car for city funerals. When given a commission to haul a casket to Washington, Ill., in his motor hearse, he accepted. This was construed by the liverymen as a violation of the agreement and the boycott was inaugurated.

Rockford Motorists to Build Club House—The club house for the Rockford Motor Club, of Rockford, Ill., will be erected next spring. Already \$3,000 of the \$10,000 required has been subscribed and no difficulty is anticipated in financing the proposition. It has been decided to ask every owner in the county to join the club and share in the benefits of the club house. Many transcontinental visitors are looked for next year and it is desired by the Rockford car owners to have the new club house and grounds ready by the time the cross-country drivers start.

Pikes Peak Road Boosters Meet—The annual meeting of the Pikes Peak Ocean-to-Ocean Highway Association was held Dec. 9 at St. Joseph, Mo., in accordance with the official call by President C. F. Adams, of Chillicothe, Mo. Chief among the topics con-

sidered was that of directing attention to this route for transcontinental touring in 1915, due to its scenic attractions. The association now has a distinctive organization, extending from Salt Lake City to Terre Haute, Ind.

Joe Matson Not a Gotch—One of the veteran race drivers who has made good on his announced retirement from speed contests is Joe Matson. For nearly 2 years Matson has been successfully handling the wholesaling of Studebaker cars in northern New York, working as a member of the New York branch. Matson gained national fame by winning the Indiana trophy at Crown Point in 1909. His last public appearance was at Indianapolis in 1912 when he drove a Lozier in the 500-mile race.

Motor Car Cut Railroad Earnings—Motor car service on the hard surfaced highways of southern Oregon is playing havoc with railroad business, according to John M. Scott, general passenger agent of the Southern Pacific Railway Co., who recently returned from a trip to Ashland, Eugene and other cities in the Willamette valley. "Without tracks, right of way or any other expensive operating requirements and with no commissions to regulate the rates they may wish to put into effect, the owners of these motor trucks and motor passenger cars have already eaten into railroad earnings to a considerable degree," said Mr. Scott. "Reduction of train service is about the only way to meet such a condition from the standpoint of the railway company. The same conditions prevail in southern California. The greatest competition of the public roads with steam roads in Oregon is between Springfield and Eugene, where regular service is now maintained by motor car companies."

Correct Faults in Badger Roads—By laying approximately 500,000 paving brick on the surface of concrete roads which did not stand up under heavy traffic because of inexperience in construction, the Milwaukee county highway commissioner has during the past season remedied defects in the permanent highway program which caused much unfavorable criticism in the past, and today every foot of permanently improved highway in Milwaukee county, totalling more than 60 miles, is in perfect shape for all kinds of traffic. When Milwaukee county started out to build permanent highways in 1912 under the state aid law of 1911, the county board of supervisors determined to use nothing but concrete. The winter of 1912, however, showed up some glaring defects attributable to inexperience in concrete road building and on several improved roads the concrete surface became full of ruts and holes because of heavy freezing. At the beginning of 1914, after the highway commissioner proved beyond doubt that the concrete roads built in 1913 would stand up when properly built, the supervisors ordered the defective roads placed in shape and decided to pave with brick, using the old concrete road as a base. A half million brick thereupon were purchased and laid with the same care as in city street paving and the result is that the reimproved concrete roads have a smooth surface and a thorough construction that should make them last as long as the highways built by the Romans centuries ago. The concrete roads built in 1913 and 1914 show no signs of deterioration.

Coming Motor Events

SHOWS AND CONVENTIONS

January 2-9—New York show.
January 8-14—Show, Milwaukee, Wis.
January 9-16—Philadelphia show.
January 11-16—Show, Buffalo, N. Y.
January 16-23—Show, Detroit, Mich.
January 16-23—Show, Cleveland, O.
January 16-23—Show, Detroit, Mich.
January 18-23—Show, Rochester, N. Y.
January 23-30—Chicago show.
January 23-30—Montreal show.
January 25-30—Show, Fall River, Mass.
January 30-February 6—Minneapolis show.
February 2-6—Show, Kalamazoo, Mich.
February 15-20—Show, Omaha, Neb.
February 15-20—Show, Grand Rapids, Mich.
February 8-15—Show, Kansas City, Mo.
February 23-27—Show, Ft. Dodge, Ia.
February 23-27—Show, Syracuse, N. Y.
February—Show, Portland, Ore.
February—Show, Toledo, O.
February—Show, Hartford, Conn.
March 6-13—Show, Boston, Mass.
March 8-13—Show, Des Moines, Ia.

CONTESTS

December 30-January 2—El Paso-San Diego road race.
January 9—Point Loma road race, San Diego, Cal.
*February 22—Vanderbilt cup race, San Francisco, Cal.
*February 27—Grand prize road race, San Francisco, Cal.
*May 29—500-mile speedway race, Indianapolis, Ind.

*Sanctioned by A. A. A.



Among the Makers and Dealers



ZENITH Company in M. and A. M.—The Zenith Carburetor Co., Detroit, Mich., has been elected to membership in the Motor and Accessory Manufacturers.

R. R. Bush Velle General Manager—Royal R. Bush, for several years general sales manager of the Velle Motor Vehicle Co., Moline, Ill., has been promoted to general manager. He was formerly with the Kingman Implement Co. of Peoria as vice-president.

Irvin Files Bankruptcy Petition—R. J. Irvin, president of the R. J. Irvin Mfg. Co., manufacturer of bodies and tops, against which bankruptcy proceedings were brought by creditors, has filed a voluntary petition in bankruptcy in the United States court at Indianapolis. He states that his assets are \$160 and his liabilities \$58,611.41.

Government Orders Duplex Trucks—The Duplex Power Car Co., Charlotte, Mich., which makes the Duplex four-wheel drive trucks, has received an order for at least twelve 2-ton trucks from the United States government. The company was one of several truck manufacturers who presented bids for trucks to be used by a certain department of the government.

Hood Tire Co. Organized—The Hood Tire Co. has been organized as a distinct corporation to manufacture motor car tires in Watertown, Mass., instead of having the work done as part of the general production of the Hood Rubber Co. The latter company does a big business in all kinds of rubber goods, including tires. Charles W. Daily is president and treasurer of the new company, which starts with a capitalization of \$20,000.

Homan with Gould Company—C. C. Homan has been engaged by the Gould Storage Battery Co. as a special sales representative, and will be located in Detroit at the company's new offices, 604 Kerr building. Mr. Homan was formerly general purchasing agent of the Willys-Overland Co. Before going to Toledo, Mr. Homan was with the Standard Welding Co., of Cleveland, as advertising manager and assistant sales manager.

New Metz Factory Completed—The new \$250,000 plant of the Metz Co. of Waltham, Mass., covering 4 acres of ground, is now completed and equipped with machinery. The mechanical departments are now housed together so there is no time lost in assembling the cars. All parts are made in the new plant. The old plant still is in use and will not be given up, because the demand calls for all the space the company can secure. The new buildings are one-story with saw-tooth roof construction. Spur railroad tracks run to the factory and during the past month the company has been making shipments in carload lots.

59,507 Fords Sold in 3 Months—During the first 3 months of the buyers profit-sharing plan of the Ford Motor Co., which started August 1, 1914, a total of 59,507 cars were sold, or an average of 19,835 cars per month or an average of 754 cars per day for each of the 79 working days. The buyers profit-sharing plan called for a return or refund of \$40 or \$60, according to the car bought, provided that between August 1, 1914, and August 1, 1915, a total of 300,000 Ford cars are sold and delivered. The 59,507 cars sold to October 31 represent a refund of at least \$2,380,280 on the basis of a rebate of only \$40 per car. By taking the average of \$50 as the return to each buyer the amount to be returned by the Ford company would be \$2,975,350 for the

first 3 months' business under the new plan. If the 300,000 cars are sold and delivered, then the return to buyers will amount to between \$12,000,000 and \$15,000,000.

Lyons-Atlas Increases Capital—An increase in capitalization from \$1,000,000 to \$1,500,000 has been made by the Lyons-Atlas Co., Indianapolis, which is preparing to market a new, medium-priced car. Experiments on the new car have been under way for several months and have about been completed.

France Orders More Truck Bodies—The Hopkins Mfg. Co., of Hanover, Pa., has secured an additional contract from representatives of the French government for one hundred and fifty more motor truck bodies. This contract, together with the one received several weeks ago, makes a total of 750 truck bodies.

Forbids Rubber and Graphite Exports—An order-in-council has been passed forbidding export of rubber and graphite from Canada to any country other than part of the British Empire. This action has been taken to prevent supplies of the commodities reaching Germany. Canada imports \$4,000,000 worth of crude rubber each year and exports about \$500,000. About \$120,000 worth of graphite is exported principally to the U. S. and the pro-

duction in Canada amounts to about \$100,000 annually. It is produced at Buckingham, Que., Calabogie and Port Emsley, Ont.

Hawkins Cyclecar Co. to Dissolve—Suit has been filed in the Xenia courts for the dissolution of the Hawkins Cyclecar Co. The directors base their claim on the ground that it is impracticable to continue manufacturing and marketing the cyclecars.

Form Company to Make Searle Tube—The Searle Unburstable Inner Tube Co. has been incorporated in New York with the ultimate object of manufacturing the Searle inner tube. The tube is an English product which was demonstrated in New York but a few months ago. The plans of the company are not fully developed. The incorporators are two attorneys and Orson Kilborn, son of Horace M. Kilborn of the National City Bank, New York. The capitalization is \$400,000.

New Foundry Boss for Maxwell—James C. Peil, superintendent of the molding department of the south works of the J. I. Case Threshing Machine Co., Racine, Wis., and previously for 16 years superintendent of the foundries of the Pierce Motor Co., Racine, now part of the Case interests, has resigned to become superintendent of the foundry of the Maxwell Motor Co. at Dayton, O.

Recent Incorporations

Akron, O.—The Rubbertown Tire Co., to make motor car tires; capital stock \$1,000; incorporators, O. J. Schwab, J. F. Darcy, N. W. Greenberger, F. Faich, H. A. Sullivan.

Albany, N. Y.—The Baker Electric Motor Service Co., to deal in motor cars; capital stock \$20,000; incorporators, F. A. Jennicky, F. Bowers, B. R. Shears.

Albany, N. Y.—The Brooklyn & Long Island Auto Assn., to manufacture motor cars, supplies and equipment; capital stock \$20,000; incorporators, A. J. Farrell, C. F. Batt, R. P. Lumely, J. G. Snyder.

Albany, N. Y.—The Cole Garage Co., capital stock \$12,000; incorporators, J. A. Sherwood, J. Hovanus, W. W. Code.

Albany, N. Y.—The Dujardin Rubber Co., to manufacture motor car tires, tubes and accessories; capital stock \$100,000; incorporators, F. E. Hutcheon, F. B. Hutcheon, Henry Dujardin.

Albany, N. Y.—The Eastern Tire & Supply Co., to manufacture motor cars and accessories; capital stock \$5,000; incorporators, A. Smith, W. T. Kincaid, J. G. Barclay.

Albany, N. Y.—The Haines Auto Accessories Co., capital stock \$5,000; incorporators, N. F. Ray, D. S. Edward, H. S. Hechheimer.

Albany, N. Y.—The Hilltop Automobile Station, to carry on a general garage business; capital stock \$10,000; incorporators, L. Johansen, M. Johansen, R. B. Hand.

Albany, N. Y.—The New Denver Ford Starter Co., to manufacture motor car starters; capital stock \$20,000; incorporators, J. Robinson, M. F. Effinger, J. T. McGovern.

Albany, N. Y.—Olewines Garage, capital stock \$50,000; incorporators, F. R. Hansell, G. Furnell, S. C. Seymour.

Albany, N. Y.—The Reid Ave. Garage & Machine Shop, capital stock \$5,000; incorporators, O. E. Weldleib, R. K. Allison, A. Goldfarb.

Albany, N. Y.—The Safety Signal Co., to manufacture signals for motor cars; capital stock \$200,000; incorporators, A. V. Dennen and R. Hilliker.

Albany, N. Y.—The Searle Unburstable Inner Tube Co., capital stock \$400,000; incorporators, F. K. Hall, O. Kolburn, J. Campbell.

Albany, N. Y.—The Spengler Automobile Co., capital stock \$10,000; incorporators, E. E. Braendle, G. Supper, Henry Spengler.

Albany, N. Y.—The Utility Motor Car Service Co., to manufacture motor cars; capital stock \$3,000,000; incorporators, F. R. Hansell, G. H. B. Martin, S. C. Seymour.

Boston, Mass.—The Co-Operative Motors Corp., capital stock \$500,000; incorporators, R. C. Boyd, H. I. Bailey, F. B. Fayler.

Chicago, Ill.—The Chicago Car Co., to manufacture motors; capital stock \$50,000; incorporators, M. Leary, E. M. Roehrhorn, J. J. Gorman.

Chicago—The King Motor Co., capital stock \$50,000; to deal in motor cars and accessories; incorporators, A. P. Mackie, C. F. Woods, J. W. MacCulehan.

Cleveland, O.—The States Motor Co., to manufacture motor cars and tires; capital stock \$500,000; incorporators, E. M. Cook, H. S. Bassett, S. H. Neff, H. M. Barfield, W. B. Smith.

Coshocton, W. Va.—The McClurg Rubber Co., capital stock \$250,000; incorporators, J. S. McClurg and others.

Dover, Del.—The Coudersport Electric & Public Service Co., capital stock \$50,000; incorporators, F. W. Kendign, T. J. Ryan, R. A. Olmstead.

Dover, Del.—The International Wire Tire Co., to manufacture, sell and deal in motor cars, tires and accessories; capital stock \$1,000,000; incorporators, J. S. Lyons, G. T. Brown, T. A. Zekoski.

Dover, Del.—The Mesco Motor Co., capital stock \$100,000; to manufacture motors and supplies.

Dover, Del.—United States Rubber Export Co., capital stock \$100,000; incorporators, E. H. Huxley, H. S. Hotchkiss, J. D. Carberry.

Dover, Del.—Utility Motor Car Service Co., capital stock \$3,000,000; to manufacture and deal in motor cars; incorporators, F. F. Russell, G. H. B. Martin, S. C. Seymour.

East Orange, N. J.—The Maccar Co., general automobile business; capital stock \$50,000; incorporators, G. F. Gallberg, W. F. Hobbie, W. A. Boone.

Newark, N. J.—The Willis Garage, to manufacture motor cars; capital stock \$10,000; incorporators, J. H. Willis, J. J. Willis, G. F. Braldenburgh.

New York—Overman Cushion Tire Co., capital stock \$150,000; to manufacture motor cars and accessories; incorporators, M. C. Overman, C. A. Tausign, W. E. Lowther.

New York—The United States Rubber Export Co., capital stock \$100,000.

Portland, Me.—The Gillette Safety Tire Co., capital stock \$1,000,000; incorporators, A. F. Jones, T. L. Croteau.

Richmond, Va.—The Baker Electric Car Co., to deal in motor cars; capital stock \$3,000; incorporators, N. R. Elrich, P. B. Smithson.

Richmond, Va.—The Commonwealth Motor Co., capital stock \$5,000; incorporators, A. G. Collins, D. E. Taylor.

Richmond, Va.—The Dixie Motor Co., capital stock \$20,000; incorporators, B. R. Wrenn, G. DeBree.

San Antonio, Tex.—The Service Auto & Supply Co., capital stock \$6,000; incorporators, T. S. Carow, W. F. Thurmond, H. M. Schuehle.

Tulsa, Okla.—Auto Repair & Mfg. Co., capital stock \$10,000; incorporators, L. F. Barnes, M. O. Randall, M. A. Campbell.

Washington, D. C.—The Anderson Pneumatic Spring & Tire Co., capital stock \$1,000,000; incorporators, W. W. Anderson, G. A. Rock, S. T. Dorsett.

Wheeling, W. Va.—The Bates Motor Car Co., capital stock \$10,000; incorporators, O. E. Bates.

Wheeling, W. Va.—The Bucyrus Rubber Co., capital stock \$150,000; incorporators, G. B. Smith and others.



Brief Business Announcements



ADRIAN, Mich.—Kenneth Wood has bought the West Side garage from Ernest Earle.

Jackson, Mich.—The capital stock of the Palmer Gauge Co. has been increased from \$25,000 to \$50,000.

Sparta, Mich.—A motor car repair shop has been opened by George Bettes in the Snowden building.

Columbus, O.—The Tracy-Wells Co., 175 North Front street, has become central Ohio distributor for Pennsylvania tires.

Boston, Mass.—Jack LeCain, a race driver, has formed a company in Boston to handle the Master carburetor and other specialties, with headquarters on Massachusetts avenue.

Niagara Falls, Ont.—Garage equipment and machinery for the manufacture of carburetors will be installed by Williams Co. of this town. Electric power will be used.

Detroit, Mich.—The William Harvey Rowland Co., Inc., Philadelphia, Pa., manufacturer of springs, has opened offices in the Dime Savings Bank building, with E. B. Busby in charge.

Indianapolis, Ind.—A repair and rebuilding shop has been opened at 516 Ogden street, Indianapolis, by Joe Moore, who won some distinction by driving a Premier car 100 miles a day for 100 consecutive days and who also drove an Empire in the 1913 Indiana-Pacific run. Moore, until recently, has been employed by the Empire Automobile Co.

Newark, N. J.—W. H. Benedict, formerly of the Detroit office of the Western Electric Co., and P. C. Little of Boston, late of the Bi-Motor Equipment Co. of that city, have been added to the Klaxon selling organization. W. G. Packard of the Klaxon service department and until recently in charge of

service in Detroit, has been transferred to the sales department. He will work in conjunction with R. G. Coghlan in the eastern territory.

Haverhill, Mass.—Nathaniel S. H. Sanders, doing business at Haverhill, Mass., as the Boston Motor Co., went into bankruptcy last week with liabilities of \$41,322 and assets of \$2,749.

South Bend, Ind.—Edward S. Madden, credit manager of the M. Rumely company, at Laporte, Ind., will become assistant treasurer of the Willys-Overland Automobile Co. at Toledo, January 1.

Milwaukee, Wis.—The Independent Electric Mfg. Co., 886 Greenbush street, Milwaukee, has increased its capital stock from \$35,000 to \$100,000 and changed its corporate title to Industrial Controller Co.

Detroit, Mich.—The Storms Electric Car Co., which was organized last week, has leased the plant formerly occupied by the Mercury Cyclecar Co., 807 Scotten avenue. This is a two-story structure having about 25,000 square feet of floor space.

Seattle, Wash.—Washington state distributing agency for the Denby motor truck has been placed with Charles A. Manning and Joseph E. Morris, of Seattle. They will immediately erect a four-story building, it being their intention to operate a body building and painting establishment in connection with the motor truck business.

Seattle, Wash.—W. H. Barnes, Seattle distributor for G. M. C. trucks, has been promoted to Pacific coast district manager for the commercial vehicles of the General Motors Co. He will spend 6 months of each year in Seattle and an equal length of time in San Francisco. He also will have supervision of the G. M. C. wholesale branch in

California. With the promotion of Barnes, the factory has decided to open a north-west distributing branch in Seattle.

Ovid, Mich.—G. F. Smith and his son have started a garage on Main street and will handle the Ford cars.

Edgewood, Ia.—A new garage will be opened here by Wetterlen Bros. as soon as the building is completed. The company has taken the Reo agency.

Milwaukee, Wis.—The Miller Mfg. Co., St. Louis, Mo., manufacturing portable garages and other buildings, has established a branch office in Milwaukee, with Eugene W. Stapf as local manager.

Chicago, O.—C. C. Hendry, formerly of the Fisk company of Texas, and J. H. Liston, formerly of the Des Moines Auto Supply Co., have joined the sales force of the Thermoid Rubber Co. The former is traveling in the northwest and the latter is branch manager at Detroit.

St. Thomas, Ont.—The National Graphite Lubrication Co. of Scranton, Pa., has selected this town as a manufacturing site for its Canadian business. D. J. Lewis, a representative of the firm, has closed a deal with the St. Thomas Bronze and Brass Co. and H. Rayner & Sons for the manufacture of lubricators for the present.

Seattle, Wash.—Northwest headquarters for the Dodge Bros. interests have been established in Seattle, John A. Nichols, representative in this section having engaged offices in the L. C. Smith building. Dodge Bros. also will maintain a factory service expert here, J. B. Brady having been assigned to that task. Dodge dealers in Washington, Oregon, Idaho, western Montana and British Columbia will be served from Seattle.

Recent Agencies Apointed by Motor Car Manufacturers

PASSENGER CARS

Town	Agent	Make	Town	Agent	Make
Alinsworth, Ia.	Marr Hdwe. Co.	Oldsmobile	Grundy Center, Ia.	A. C. Shafer	Oldsmobile
Atlanta, Ga.	Geo. W. Hanson	Saxon	Griffith, O.	G. L. Schiear	Oldsmobile
Azelia, Mich.	A. J. Howe	Haynes	Greenville, Mich.	John & Milo Christensen	Dodge
Aberdeen, S. D.	T. E. Payne	Haynes	Granger, Ia.	Fred L. Anderson	Oldsmobile
Bucyrus, O.	Samuel Hirtz	Empire	Holland, Mich.	M. Barnum	Studebaker
Bloomington, Ill.	J. E. Lockwood	Ford	Hudson, S. D.	S. F. Hoffman	Haynes
Boston, Mass.	Reed-Crockett Co.	Briggs-Detroit	Hudson, Ia.	Ray McDowell	Oldsmobile
Bucyrus, O.	J. M. Smith	Empire	Hurleyville, N. Y.	W. J. Prince & Son	Haynes
Bloom, Kans.	Martin & Kinney	Haynes	Ithaca, N. Y.	J. P. Lang Eng. & Garage Co.	Haynes
Buffalo, N. Y.	Poppenburg Motor Car Co.	Saxon	Lake Mills, Wis.	F. M. Seaver	Studebaker
Clio, S. C.	F. G. Covington Auto Co.	Haynes	Lacon, Ill.	J. R. Balsley & Son	Haynes
Cawker City, Kans.	J. F. Meyer	Oldsmobile	Lebanon, Pa.	F. W. Sando	Briscoe
Clearfield, Pa.	Wallace Garage	Haynes	Kingman, Ariz.	Old Trails Garage Co.	Oldsmobile
Cheboygan, Mich.	Cheboygan Auto Sales Co.	Studebaker	Latrobe, Pa.	Ross & Steele	Oldsmobile
Carey, O.	Black & Black	Oldsmobile	Marengo, Ia.	Jos. Mulhern	Haynes
Chambersburg, Pa.	National Auto Co.	Saxon	Marion, Ind.	H. V. Smith	Saxon
Cone, O.	G. L. Schiear	Dodge	Moville, Ia.	Ed. E. Flegan	Haynes
Circleville, O.	G. L. Schiear	Dodge	Missoula, Mont.	Tumulla & Bleier Auto Co.	Oldsmobile
Clear Lake, Ia.	Scott & Leonard Auto Co.	Oldsmobile	Marshall, Minn.	M. F. Thomas	Haynes
Columbus, O.	F. E. Avery & Son	Jeffery	Massillon, O.	Miller Garage	Oldsmobile
Delaware, O.	G. L. Schiear	Dodge	Newton, Ia.	C. S. Weston & Co.	Oldsmobile
Dundee, N. Y.	Earnest & Co.	Haynes	Nevada, Ia.	Central Iron Garage	Haynes
Delphos, O.	Mox Motor Co.	Oldsmobile	Perry, Ia.	Wilson Auto Co.	Haynes
Delphi, Ind.	R. C. Julien	Haynes	Pella, Wis.	F. A. Grosskoph	Haynes
Dallas, Tex.	Saxon Sales Co.	Saxon	Richmond, Utah	Fair Auto Co.	Oldsmobile
Delavan, Wis.	C. H. Burns	Overland	Roanoke, Va.	Motor Air Pumping Sales Corp.	Dodge
Delavan, Wis.	C. H. Burns	Ford	Sabula, Ia.	E. L. Smith	Herff-Brooks
El Centro, Cal.	C. E. Coggins	Oldsmobile	San Jose, Cal.	Boschken Motor Car Co.	Haynes
Eau Claire, Wis.	Johnson Machine Wks.	Haynes	Salina, Kans.	C. W. Tibbley	Haynes
Eau Claire, Wis.	Darwin Motor Car Co.	Oldsmobile	Sioux City, Ia.	Wyckoff Auto & Supply Co.	Haynes
Elkins, W. Va.	C. H. Earle	Haynes	Story City, Ia.	Story City Auto Co.	Oldsmobile
Fremont, O.	The Palace Garage	Overland	Sun Prairie, Wis.	E. E. Beers & Co.	Dodge
Findlay, O.	Castle's Garage	Haynes	Terre Haute, Ind.	J. G. Matheny	Haynes
Greenville, O.	Walter E. Brown	Haynes	Tolono, Ill.	Guy E. Duell	Haynes

Stewart Parts Prices Reduced!

(Effective January 1, 1915)

A GAIN the Stewart-Warner Speedometer Corporation gives to its patrons the benefits of savings because of large production.

Stewart Speedometer Parts are now produced in such tremendous quantities as to make possible great reductions in price:

Part No.	Description	New List Price	Old List Price
	Swivel Joint.....	\$2.50	\$4.00
	Grease Cup.....	.15	.25
	Grease Cup Cap.....	.15	.25
1799	Flexible Shaft, complete, without leather covering.....	3.00	5.00
1911	Flexible Shaft Casing, without leather covering.....	1.75	3.00
	Extra Length Casing over 78" per foot.....	.35 net	
1880	Upper End Clutch of Chain.....	.10	.20
617	Sliding Bar and Lower End Clutch of Chain.....	.20	.30
	Road Wheel Gear complete with Washers and Screws.....	1.00	1.50
	Washers and Screws for use on Road Wheel Gear (set of three).....	.15	.25
	Pinion or Small Gear (Steel or Fibre).....	.25	.75
	Clamp for Steering Arm, complete.....	1.25	1.50
4003	Clamp Part (Upright).....	.50	.75
4025	Clamp Part (Swivel Block).....	.20	.30
4015	Clamp Part (Cross Bar).....	.30	.45
4017	Clamp Part (Axle Clip).....	.15	.30
4014	Clamp Part ("S"—Clamp Link).....	.20	.30
4007	Clamp Part (Cross-Bar and Straight Link—one piece).....	.30	.45
1996	Rubber Fender Washer.....	.15	.25
2199	Brass Footboard Collars.....	.15	.25
1998	Strap or Hanger for Flexible Shaft.....	.15	.25
	Angle Sleeve.....	1.50	2.50
1902	Flexible Shaft Chain, per foot.....	.25	.50
1997	Stewart Flexible Shaft Lubricant, per can.....	.30	.50
616	Flexible Shaft Ferrule and Union.....	.20	.30

Discount to Dealers—20% from new list prices.

\$150. Worth Of Parts For \$100.

Dealers making up an order of parts amounting to \$150. at list prices can purchase same at \$100.

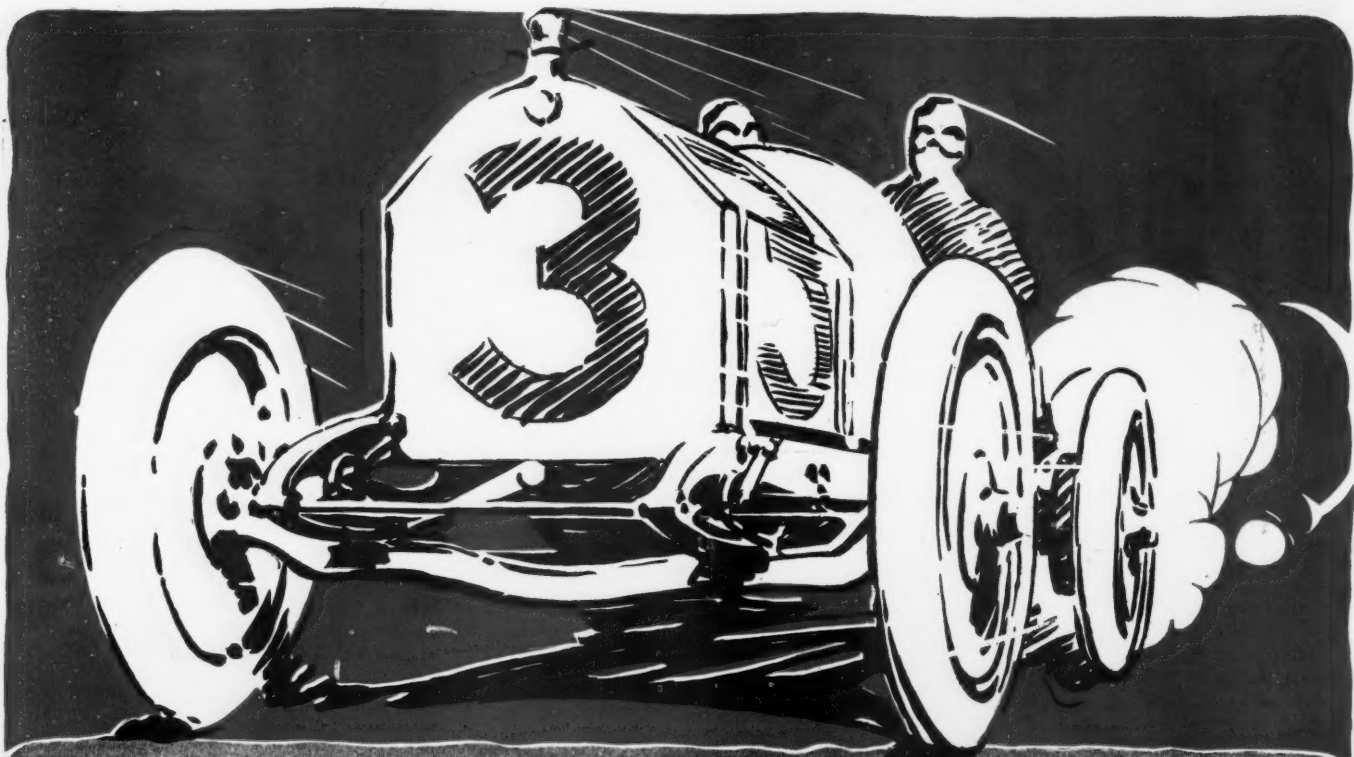
Pinions purchased in lots of twenty - - \$3.

Stewart-Warner Speedometer Corporation

Executive Offices: 1931 Diversey Blvd., Chicago.

Factories: Chicago and Beloit, U. S. A.

17 Branches. 70 Service Stations in all cities and large towns



SCHEBLER

WORLD'S RECORD CARBURETOR

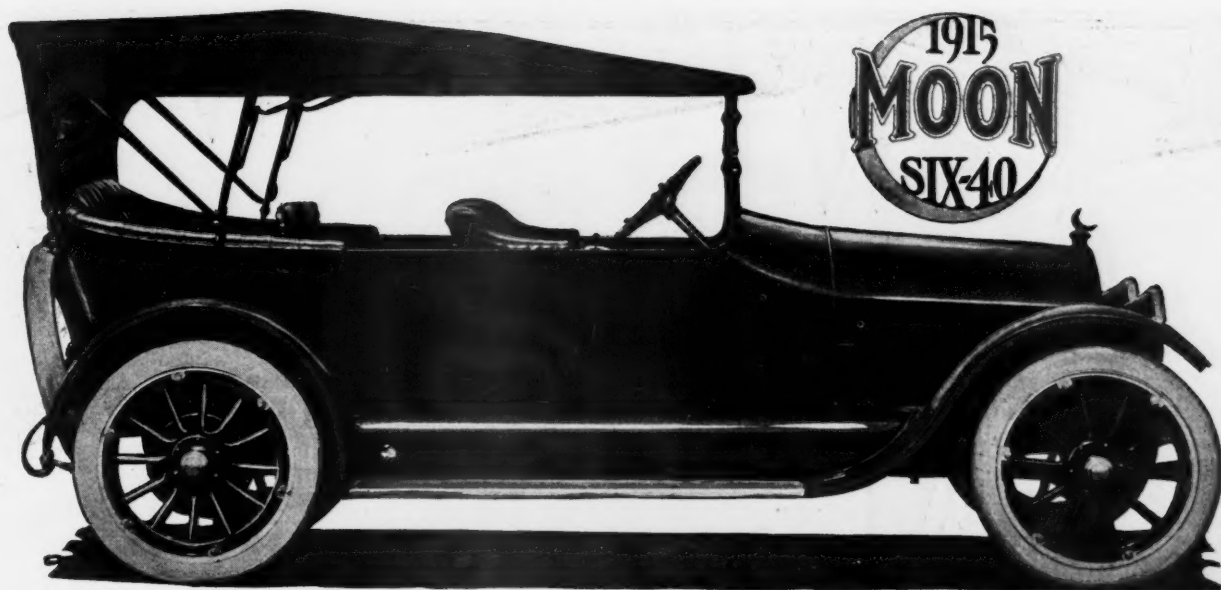
**STANDARD
EQUIPMENT
ON AMERICA'S**

CHAMPIONS

WHEELER AND SCHEBLER

INDIANAPOLIS

INDIANA U.S.A.

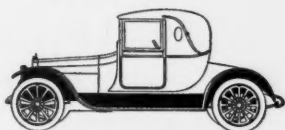


1915
MOON
SIX-40

Five Passenger

\$1575

Fully equipped, including Delco New Type Starting, Lighting and Ignition (with two Extra Seats, \$25 additional).



Six-40 Cabriolet

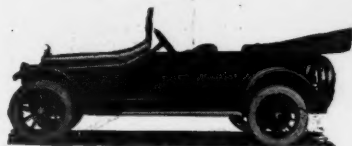
\$1950



Five Passenger—Four-38

\$1350

Combines the best features of the best European models—high-speed motor and light-weight car. See the picture and appreciate the lines. Send for literature. Completely equipped, including new type Delco Starter, Lighting and Ignition with automatic spark advance, \$1350.



Seven Passenger
Light Weight Six-50

\$2250

The car that spread Moon cars all over the map last season—refined, beautified and bettered this year. Send for literature and full details. Completely equipped, including new type Delco Starting, Lighting and Ignition with automatic spark advance. Seven passenger, \$2250—five passenger, fully equipped, \$2150.

An Overwhelming Demand

The New Moon Six-40 has taken dealers and buyers by storm, on lines, features and price. This is not "selling talk", but the plain unvarnished truth. Our dealers have kept us swamped with orders since the new model has been out, but we've now increased our capacity to supply the tremendous demand. The Six-40 can truly be termed the season's sensation.

Increase in Sales of Over 46%

Just as a proof, our season of 1915 models (three months at this writing) shows the remarkable increase of 46%—and remember—this increase for us means an increase for our dealers.

New Moon Six-40

is a wonderful car at a wonderful price. Study the photographs shown—they've not been retouched. Don't they display just the gracefulness and sturdiness that you want? Think of its having a 6-cylinder, 3½x5 Continental engine (low power plant)—the motor they all take their hats off to. 1915 Delco Electric Lighting, Starting (new one-wire system) and Ignition with automatic spark advance—the system that's the standard of all.

A Few of the Many New Features:

Pure Streamline Body	Delco Electric Starter
Continental Motor (see above)	Delco Electric Lighting and Ignition System (see above)
Left Drive, Center Control	Full-floating Rear Axle
Dry Plate, Multiple Disc Clutch	One-Wire Top with Collins Curtains
34x4 Q. B. Tires—extra rim	
34x4 Q. B. Tires—extra rim	
One-Wire Top with Collins Curtains	

—in fact every possible thing in the way of equipment and appointment that makes the most desirable car of the season.

But—the Moon Line is Not A One-Car Line

You've got a choice of three to offer your customers. Besides the Six-40 there are the Moon Light Weight Six-50 and the Four-38—both of them big sellers this season. You can offer Roadster, Touring (with or without extra seats), Cabriolet, Sedan, Limousine—to suit the individual preference and requirements of the purchaser.

Sell the Complete Line

The line that enables you to offer each customer the car that suits him best. Due to new and shifting territories it's possible yours may be open. Write us to-day—and see. If open we'll have our district manager call to see you with full information.

Moon Motor Car Co., St. Louis, U. S. A.

When Writing to Advertisers, Please Mention Motor Age.

The Advertising— Your Part In It

What the magnetic center is to the compass, advertising is to the sale of a motor car—the compelling, irresistible attraction which draws customers to your sales room.

We surround the Regal dealer with the best advertising introduction that money will buy. No missionary work is necessary—no pioneering—no expensive waiting while the public is being educated.

The motoring public know the REGAL now—the beautiful—comfortable—powerful—economical motor car—Persistent advertising has established the REGAL as a popular priced automobile.

Why Not Get Yours?

Your share of these sales—your share of the handsome profits that must result from handling a car that is so thoroughly known—from being a part of an organization that constantly employs every possible channel to influence customers, your friends and neighbors, to buy REGALS.

THE SIX REASONS

1. *The Car Itself*
2. *The Organization Behind the Car*
3. *The Advertising*
4. *The Sales Promotion*
5. *The Regal Service*
6. *The Proposition to Dealers*

You know that a car well advertised is half sold—it takes less of your time and money to clinch the sale—all of which means easier profits and more of them. **THIS IS WHAT YOU want**—what every intelligent dealer has been looking for.

Get in touch **today**—NOW—your territory may be taken tomorrow.

Regal Motor Car Company
201 Piquette Ave. Detroit, Mich.
Canadian Factory, Canadian Regal Motors,
Ltd., Berlin, Ont.



Nobody Home

What's the matter with that starter anyhow?

Nothing, your battery is frozen to death, that's all. Take it out, give it decent burial and put in a Willard.

Then you can stay in the front seat, push the button and let her buzz! She'll turn that old engine over so fast it will make your head swim.

Somebody Home

There's always somebody home in the Willard Shops. Somebody inspecting every grid; Somebody rejecting those "good-enough-for-some-folks" oxides that fall below Willard standard; Somebody watching every man, machine and operation. It's all these little things put together that mean good hot service in cold weather.

ANSWER—Willard on the job in 85% of all electrically equipped cars.

Willard STORAGE BATTERY

Willard Storage Battery Company
Cleveland, Ohio

New York Branch: 228-230 W. 58th St.
Chicago Branch: 2524-30 S. Wabash Ave.

Detroit Branch: 736-740 Woodward Ave.
San Francisco Branch: 821 Monadnock Bldg.

Indianapolis Branch: 318 North Illinois St.

Service Stations in All Principal Cities in the United States, Canada and Mexico

THE NATIONAL AUTO SHOWS



Under Auspices of National Automobile
Chamber of Commerce, Inc.

At NEW YORK

Grand
Central

PALACE

January 2 to 9

At CHICAGO

Coliseum and 1st Regiment Armory

January 23 to 30

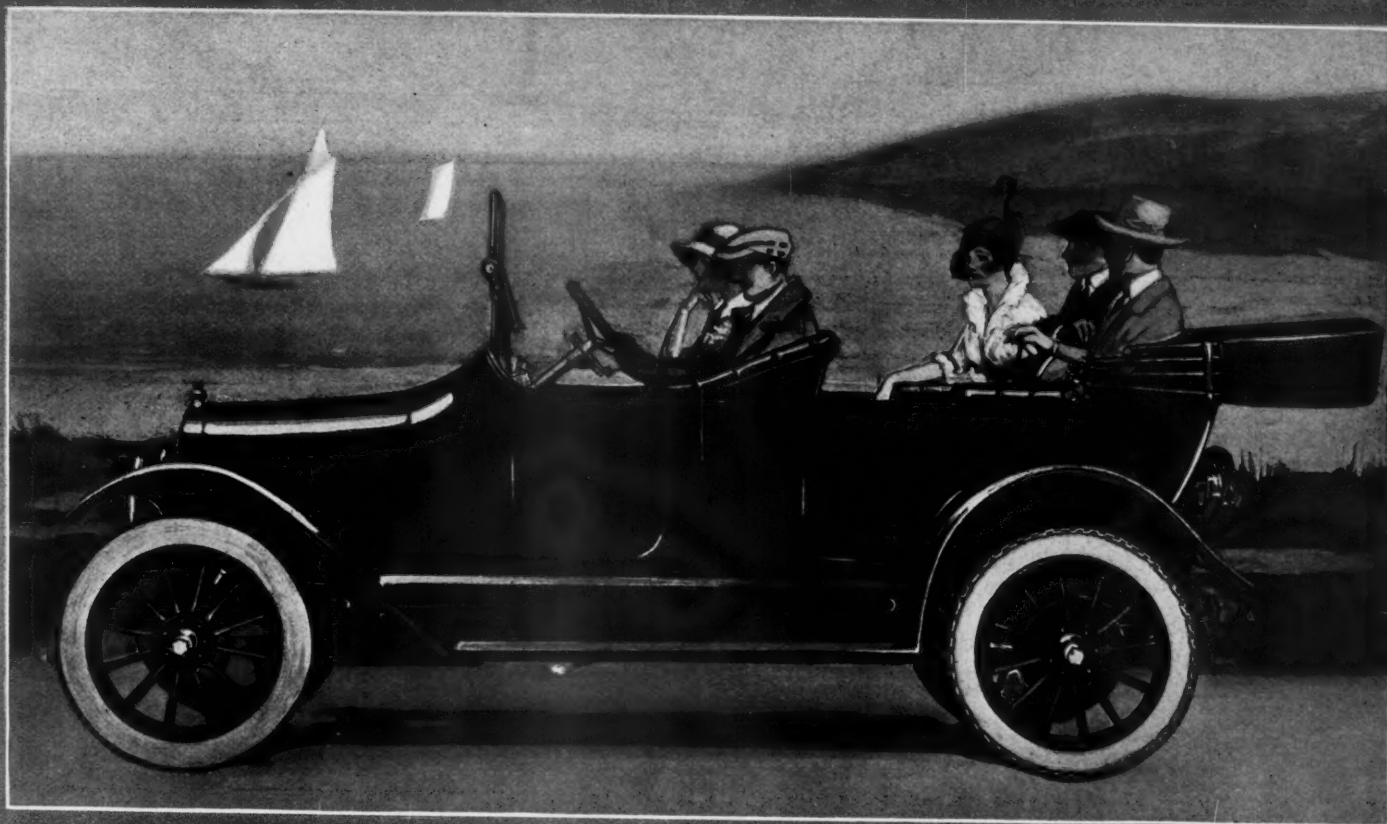
***Passenger Vehicles—Motorcycles
Parts—Accessories***

Both Shows Bigger and Better Than Ever

S. A. MILES, Manager

7 East 42nd Street, New York City

The Usual Courtesies to Visiting Dealers



MAXWELL

\$695



Immediate
Deliveries
versus
Promises

Deliveries made
possible by the Great
Maxwell Factories





THROUGH the genius of this man for organization and his marvelous work, the
**MAXWELL MOTOR
COMPANY**

has developed into such a Titan of manufacturing strength that today its sales and its production are marching along hand in hand to the tune of 1000 cars per week.



The Beautiful New 1915 Maxwell "25"

New Price \$695

With 17 New Features



Holds the Road at 50 Miles an Hour

New Price \$695

With 17 New Features

The Sensation of the Automobile Year

The biggest automobile value ever offered for less than \$1,000 Our production of 60,000 cars makes the new price of \$695 fully equipped (with 17 new features) possible.

Here are the Seventeen New Features

1.—Pure stream-line body.

2.—Adjustable front seat.

3.—New high-tension magneto.

4.—Three-quarter elliptic rear spring.

5.—Powerful dual—completely braked and handled in its lines—coarse, comfortable and completely equipped with the Windshield and Speedometer the New 1915 Maxwell is built for less than \$1,000.

6.—The brackets on rear.

7.—Spring tension bar.

8.—Spring carrier.

9.—Close Vision Wind Shield.

10.—Patent for conversion model.

11.—12 Lights, with license brackets attached.

12.—Cover hood with all rivets concealed.

13.—Head light based by rod running between lamp.

14.—Famous make of anti-kick tire on rear.

15.—Greatly improved, double-shell radiator equipped with shock absorber device.

16.—Instrument board carrying speedometer, voltmeter adjustment and gasoline filler.

17.—Improved steering gear, shock and chassis control on standard make.

Automobile experts have refused to believe that anyone could produce a car with all these features for less than \$1,000. Here it is. Here is a real automobile. Here is the easiest car to drive in the World—here is the greatest all around hill climbing car in the world. Here is an automobile to be really proud of.

Every car backed by the great Maxwell Motor Co. Inc. Service Station in physical class.

With Electric Self-Starter and Electric Lights \$55 Extra

The new 1915 "Wonder Car" is on display at Maxwell dealers. See it at once. If there is no dealer in your town write or wire us. Send your name and address for the New 1915 Catalog.

Maxwell Motor Co., Inc., Detroit, Mich.

50,000 Cars Ordered Since August First

The above double-page advertisement appeared in the leading newspapers throughout the United States and was followed by Maxwell page advertising in trade and national publications announcing the new 1915 model Maxwell "wonder car" about August first. Within six weeks 37,000 cars were positively ordered by Maxwell Dealers. Today 50,000 cars are ordered. Never since the automobile was born has anything of such a positive and stupendous character been achieved. From every city and town in the country where Maxwell Dealers are established the orders for the 1915 cars are pouring in. After Maxwell's last year triumph a wave of popular appreciation of what Maxwell manufacture meant swept over the country and today it is almost universally believed that no agency can offer more permanent and profitable possibilities than that of the Maxwell "wonder car" at \$695.

**The
Announcement
That Brought
Orders for
50,000
Cars**

What Deliveries Mean to Dealers

What dealer would give a tinker's darn for the agency for a car of which he could sell large numbers but the maker of which could not deliver the cars.

Maxwell Dealers are the most fortunately situated retailers in the whole automobile field, because—

First: Maxwell cars have received such national publicity and such universal endorsement that they now stand in the front rank as the most economically manufactured high-class light cars in the world and *the greatest selling value.*

Second: Maxwell cars are being manufactured in the most wonderfully organized factories ever devoted to building automobiles and are actually at this moment being produced at the rate of nearly one thousand cars per week.

Do you realize what that means? A thousand cars per week. Continuous train-loads of automobiles leaving our factories supplying right up-to-the-minute the needs and demands of every dealer selling Maxwell cars—this spells dealer profits.

The Most
Talked About
Advertisement
of the
Automobile
Year

These are the Factory Men

Who produce the Maxwell "Wonder Car."

They are conceded to be the leaders
in their respective branches of
the automobile industry

It takes more than money and superior
factory equipment to produce a car
like the Maxwell. It takes brains.

A master mind must design such a car;
an expert metallurgist must purchase
the steel that goes into it, after having
decided by intricate laboratory tests
the exact quality of steel required for
the various parts of the car.

The factory superintendents and man-
agers must know their respective duties
thoroughly. They co-operate with
each other, and it is largely their initi-
ative and ability that have made the
name "Maxwell" known in every
quarter of the world.

The men listed here are eminently
successful in their particular field of
endeavor, and together they undoubt-
edly are the greatest combination of
automobile experts ever employed by
one automobile manufacturing organi-
zation.

GEORGE W. SMITH
Production Manager, in charge of
all manufacturing operations of the
Maxwell Company.

The difficult work of main-
taining the tremendous
Maxwell quantity produc-
tion is the duty of Mr.
Smith.

Mr. Smith must keep every-
thing running smoothly and
be constantly on the alert
to find new automatic ma-
chinery with which to in-
crease the number of Max-
well cars made each day.



RAY HARROUN
Chief Engineer, head of all design
and experimental work.

Mr. Harroun and his assist-
ant, Mr. Kelly, solve the
intricate engineering prob-
lems involved in the design-
ing and manufacturing of
the motor and chassis of
a real full five-passenger
automobile to sell at \$695.
The fact that the Maxwell
is the only automobile ever
made and sold at this price,
containing an equal num-
ber of features ordinarily
found only in highest-
priced cars, is certain proof
of their qualifications.



E. J. MILES
Chief Metallurgist. His word is
law in the analysis and treatment of
all materials used in Max-
well cars.

Mr. Miles, in his splendid-
ly equipped laboratory,
makes the analysis which
determines the specifica-
tions and qualifications
of the steel used in the
Maxwell car.

Mr. Miles and his depart-
ment determine whether
each and every shipment of
steel delivered to the Max-
well Factories is in accord-
ance with our formulæ.





WILLIAM KELLY

Mr. Kelly, one of the Engineers of the Maxwell Company, who, with his associate Ray Harroun, has charge of the Engineering Department.

Mr. Kelly's duties concern the motor and the chassis.



F. L. ALLDIS

Superintendent of Briscoe Mfg. Co., Detroit The Briscoe Mfg. Co. is owned and operated by the Maxwell Company.

All Maxwell radiators, fenders, tanks, running boards, pans, stampings, etc., are produced by this factory. The best evidence that Mr. Alldis is a leading automobile factory manager is to be found in the wonderful durability of the Maxwell radiators. In many makes of cars the radiator is a weak part. In the Maxwell it is trouble proof.

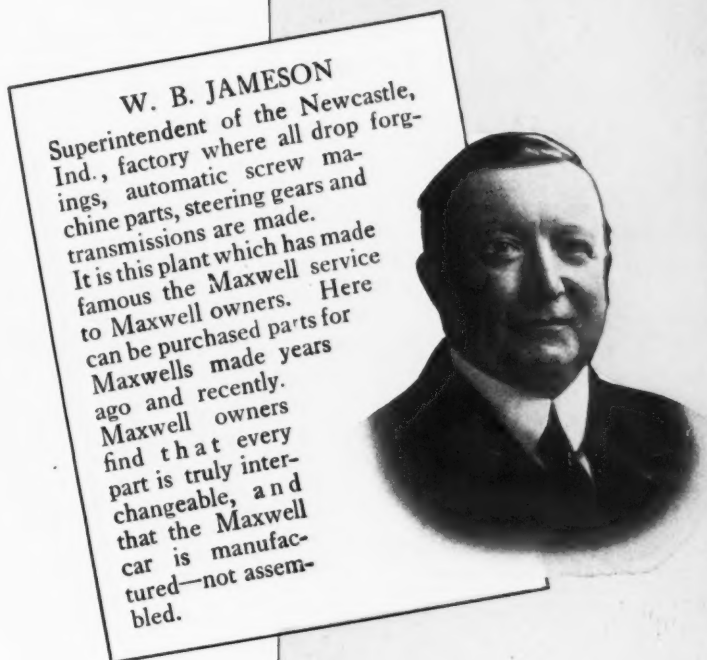


CHARLES ADAMS

Assistant Production Manager. Assists Mr. Smith with all manufacturing operations.

Mr. Adams has charge of the Detroit factory, where an army of thousands of skilled mechanics are under his watchful eye at all times.

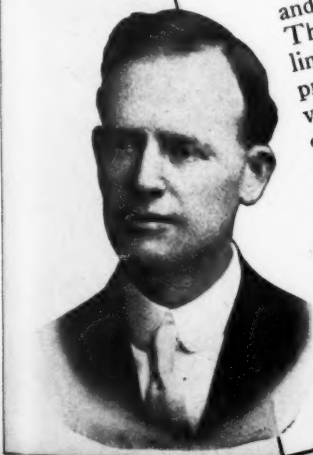
He is famed for his ability to handle men, and to keep every wheel in the great manufacturing machine turning smoothly.



W. B. JAMESON

Superintendent of the Newcastle, Ind., factory where all drop forgings, automatic screw machine parts, steering gears and transmissions are made.

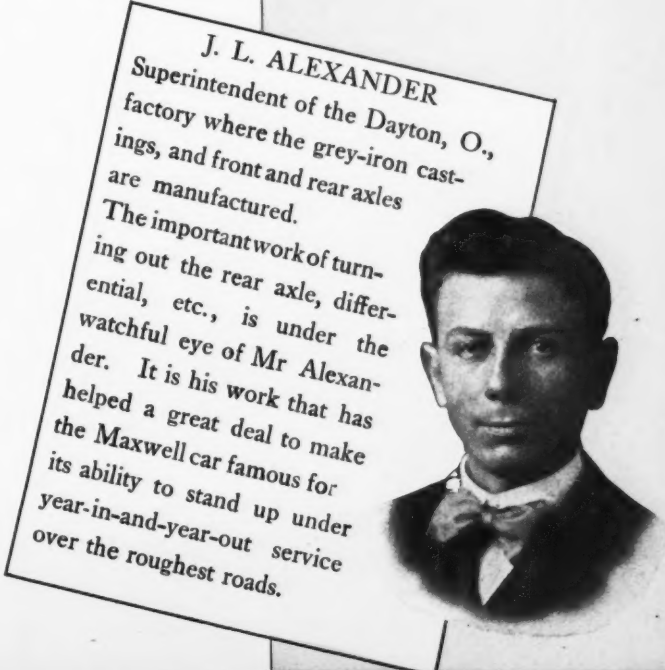
It is this plant which has made famous the Maxwell service to Maxwell owners. Here can be purchased parts for Maxwells made years ago and recently. Maxwell owners find that every part is truly interchangeable, and that the Maxwell car is manufactured—not assembled.



BRUCE OTT

Body Designer. He excels in beautiful body designs. Also Superintendent of Maxwell body and top factories.

The 1915 Maxwell's streamline body was designed and produced under the supervision of this man. The engineering problems involved in the body designing of a light-weight, full five-passenger automobile body are many. That Mr. Ott is capable of solving them is plain to anyone who will look at the beautiful body job on the 1915 "Wonder Car."

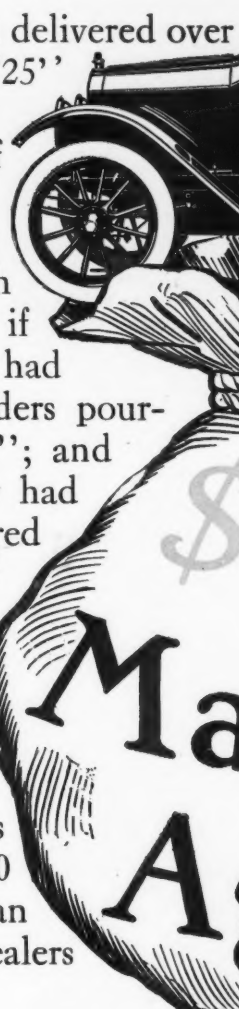


J. L. ALEXANDER

Superintendent of the Dayton, O., factory where the grey-iron castings, and front and rear axles are manufactured.

The important work of turning out the rear axle, differential, etc., is under the watchful eye of Mr. Alexander. It is his work that has helped a great deal to make the Maxwell car famous for its ability to stand up under year-in-and-year-out service over the roughest roads.

The Most Prized Acquisition in the Auto



Last year the Maxwell Motor Company built and delivered over 18,000 "25"s. That Maxwell "25" was an eye-opener—a real automobile surprise. A lot of men, long familiar with the automobile business, looked at it when it first appeared with its light weight, its high class features and low price as a novelty, if not to say, an experiment. Before three months had passed the Maxwell Dealers, with their steady orders pouring into the factories, gave the industry some "jolt"; and when the season had closed the Maxwell Company had actually produced, sold and delivered over 18,000 first-class, tremendously successful, light-weight cars in one year. Everybody's hat was off to this. At first there was also some scepticism regarding the character and stand-up-ability of this Maxwell "25" car. At the end of the first year it was found that the Maxwell Dealers had less real trouble and less expense in keeping these 18,000 cars running in fine condition than any other group of automobile dealers in the country.

When You Sell a Maxwell You Can Get It From the Factory Promptly

This year the Maxwell Company will produce 60,000 automobiles. Naturally they improved the car in many details. Seventeen new distinct features have been added

Why Not Be the Biggest Automobile

The 1914 Maxwell made many automobile dealers find. This year with the mammoth production of the Maxwell exist for those who act as the link between the Maxwell

If you have any inclination or objection you will be a lucky fellow to obtain a valuable section

for the sale of

Maxwell C

the Automobile Field—The Maxwell Agency



The \$
Maxwell
Agency

for this year and the price has been reduced to \$695—think of it, \$695 for a really full-size, high-power, beautiful five passenger automobile. 60,000 cars announced for this year, and six weeks after that announcement more than half the year's product was sold. Today over 50,000 of the new 1915 model have been ordered and there seems to be no question about the Company selling 60,000 and there is certainly no question about the Maxwell Company's ability to produce that number. Ever since August 1st almost one thousand cars per week have been turned out of the Maxwell factories and in every case sold, signed and delivered.

That's Certainly Some Record!

The Maxwell Dealer who has the opportunity of showing to his customers this famous "wonder car," which has received more editorial comment, has been backed by more widespread and substantial advertising than any other car made this year, is indeed in a fortunate position. He has a car of supreme worth and unheard of value to offer at such a phenomenal price, and at

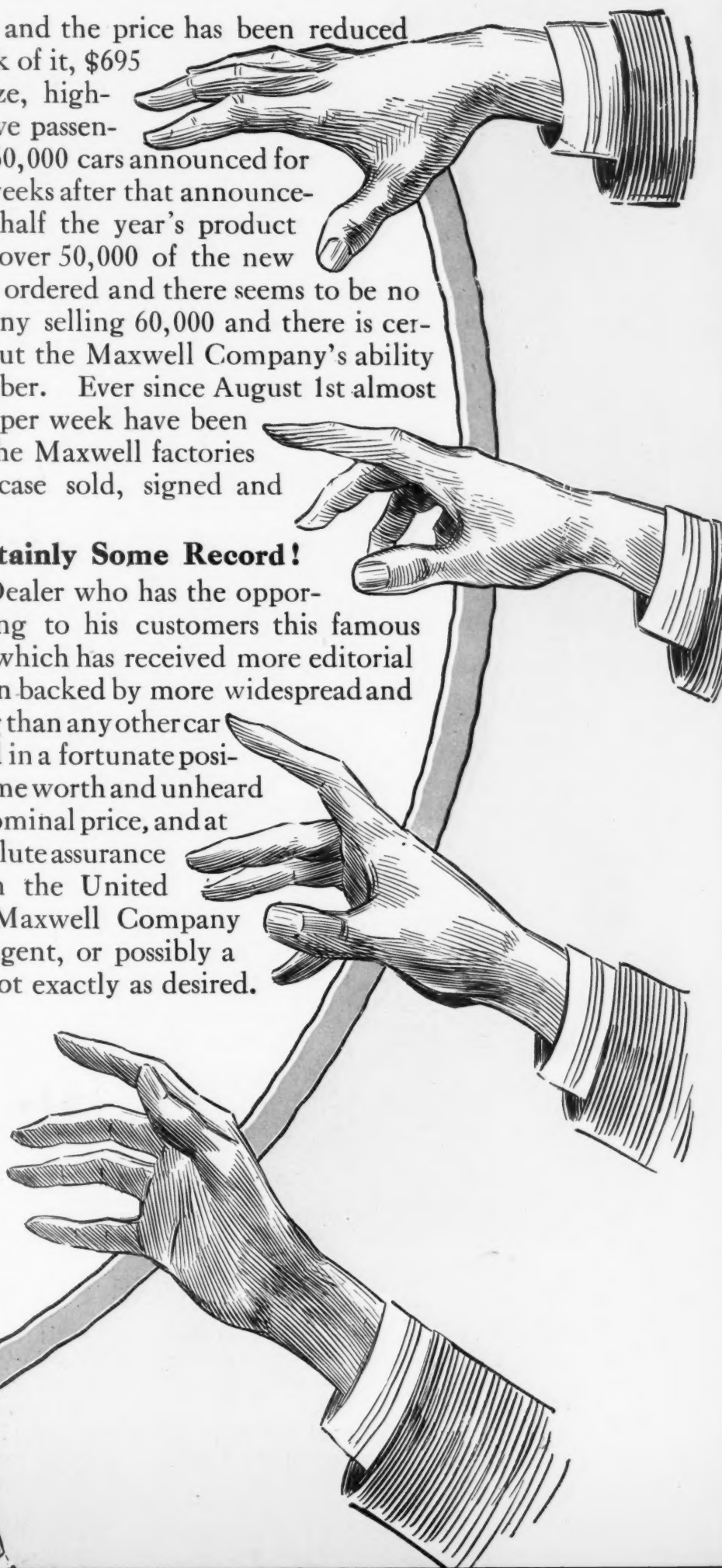
It the same time he has behind him the absolute assurance of Maxwell deliveries. There are, in the United States, still some places where the Maxwell Company would be pleased to establish another agent, or possibly a few places where the representation is not exactly as desired.

Automobile Dealer in Your Territory

Mobile dealers first rank men in their respective cities. The Maxwell even greater opportunities between the Maxwell factory and the motoring public.

any inclinations in this direction will be a lucky man indeed. A valuable section of territory for the sale of

Maxwell Cars





Publicity Paid For By The Manufacturer—

The Maxwell Company, based on the big-production plan, has been one of the most ardent believers and consistent users of *big publicity* since the automobile began.

The Maxwell Company within one year will spend \$1,000,000 in advertising as a direct support for your sales, Mr. Dealer, and is expending it under as wise professional supervision as can be found.

Maxwell advertising is receiving the widest pos-

sible distribution, and wherever it goes it carries with it the conviction of the truth which underlies Maxwell superiority.

No matter where you may be located—in Maine or California—the constant flood of Maxwell advertising reaches the people around you; in fact, the mediums are so selected that no part of the country is neglected and no dealer is unsupported.

General publications, the leading great weeklies



Is A Tremendous Asset For The Dealer

and magazines, local newspapers, and every other means found to be highly efficient advertising, are used. The national weeklies and magazines go into the hands of the people at large and are read in their leisure moments—at times when their thoughts have turned away from "business." Maxwell advertisements—advertisements that brings you customers—have a receptive audience. In well-selected newspapers these advertisements are no less effective.

In addition to all this, the Maxwell Company offers big feature services, characteristic of Maxwell progressiveness.

The Maxwell racing team is constantly scoring victories, constantly attracting attention.

The marvelous \$40,000 motion picture film entitled "From Molten Steel to Automobile" is one of these unique master-strokes which will be discussed in the following pages.



A Splendid Entertainment

A Highly Educational Exhibition—A Tremendous Successful Selling Force

The Maxwell Company's five reel film sensation was produced at a cost of \$40,000.

Six months were spent by the greatest known moving picture producers in taking this famous five reel film sensation.

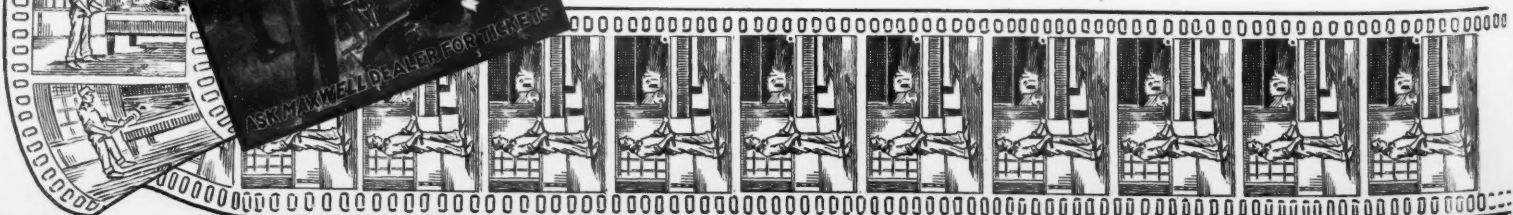
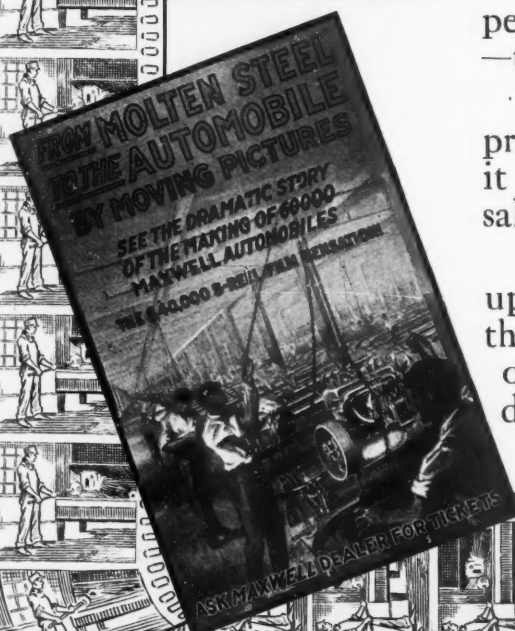
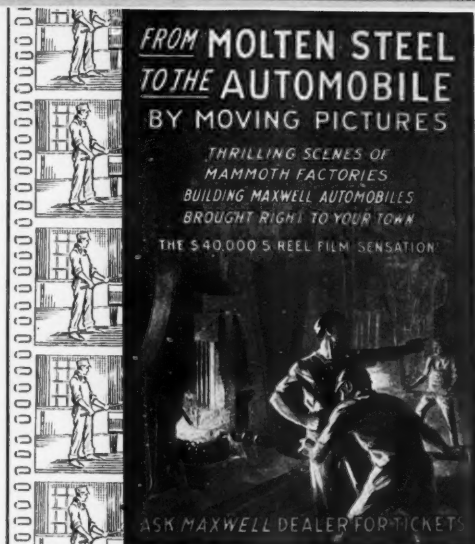
In cities and towns all over the United States the "Maxwell Movies" are being shown to capacity audiences. A trained lecturer, supplied by the Maxwell Company, gives an intensely interesting talk which bristles with facts and selling arguments for the Maxwell car. At every exhibition held to date the dealer, under whose auspices the pictures have been shown, has invariably booked a number of orders for cars.

Interwoven with the factory pictures are scenes of wonderful and exciting performances made by the Maxwell car on race tracks, on hills, in hill climbing contests, and on mountain tours. Glimpses of magnificent mountain scenery in California are shown, and running through the entire entertainment is the human interest drama which accompanies the purchase of a family automobile. A young girl is shown asking her father to buy her a car—he goes to the Maxwell dealer and is given a demonstration. He buys a car—the daughter is taught to drive, and toward the close of the entertainment is shown taking her friends for a ride in her new Maxwell "Wonder Car."

The cost of the "Maxwell Movies" to dealers is very, very low. The Maxwell Company practically pays all the expenses. The dealer is only asked to pay a very small sum—the amount depending upon the population of his town.

An exhibition in your town, under your direction, will produce greater results for you than ten times the amount it would cost you spent in any other form of publicity or sales promotion.

Think of what a tremendous impression it would make upon your prospective customers if you could take them through the great Maxwell factories step by step pointing out the numerous manufacturing processes involved in producing the world's greatest low priced car.



nd-

00.
est
ng

ed
ng
ec-
y,
ch
for
eld
the
ply

on-
car
on
ery
ire
m-
girl
the
s a
ose
de

de

very
ex-
m
yn.
will
ant
or

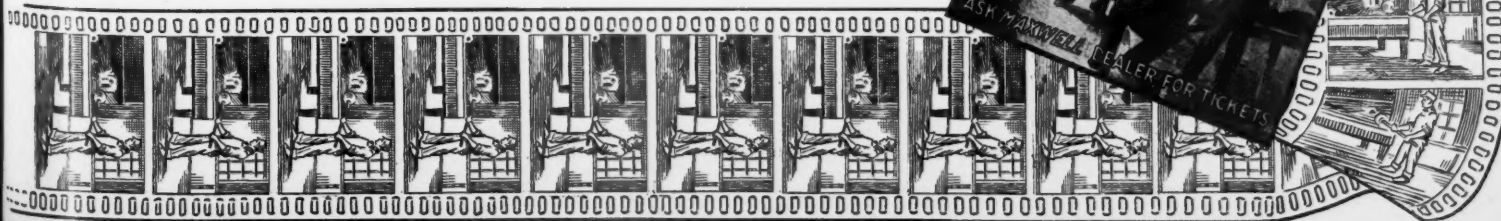
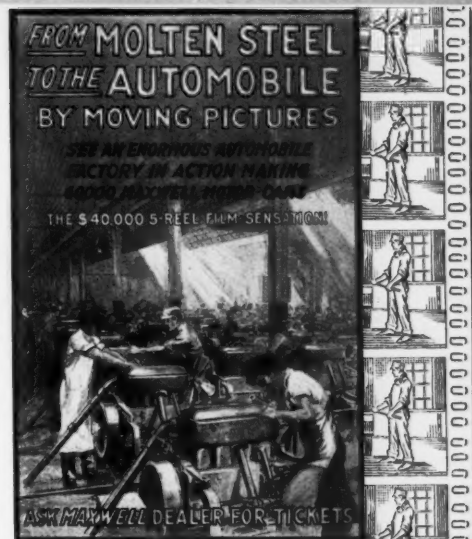
ke

like
em
ing
ro

000



600



The Newspaper Advertising We Furnish with the Films

Fish in the brook won't help your table any more than apples in the orchard.

No matter how wonderful an exhibition may be it fails in its purpose without attendance. And here again we demonstrate the Maxwell thoroughness in action.

Wherever these Maxwell films are to be shown, we open up the campaign with two weeks of newspaper advertising. For this purpose we furnish the advertising as shown on these pages. We furnish the complete ad. in electrotpe form ready to run. Of course, the name of the dealer appears at the bottom and the name of the place where the pictures are shown also appears.

Besides this, we make sure that the right editorial comments appear in all these papers when the pictures are run so that the entire population throughout the surrounding country may be familiarized with the fact that these remarkable pictures are available, and those interested in the purchase of a motor car may have an opportunity to see them.

Poster Broadsides

And in addition to the newspaper campaign, the special folders and booklets, we bill-post your city with all sizes of eye-compelling, attention-getting posters. These posters not only advertise the show but help to advertise the Maxwell Car and your business.



Coming to
St. Louis
September 1st

Don't Miss
This Big
Attraction

THE
\$40,000 - 5 REEL
FEATURE FILM SENSATION

"Molten Steel
to Automobile"

Coming to
Mentor
Lyric Theatre,
September 3rd.

"From Molten Steel
to Automobile"

THE
\$40,000 - 5 REEL
FEATURE FILM
SENSATION

The Big
Theatrical Motion Pic-
ture Entertainment and Ex-
hibition produced and presented
by the Maxwell Motor Co.

Free Tickets Upon Application

M. V. Hanson
Mentor, Ohio

The \$40,000 - 5 Reel
Feature Film Sensation
INTERESTING, VIVID, FASCINATING
EDUCATIONAL MOVING PICTURES

"From Molten Steel
to Automobile"

We have secured the famous big fas-
cinating Motion Picture Exhibition and
Entertainment of the Maxwell Motor Co
Conceded by thousands to be the most
interesting and unique Motion Picture ever
produced.

A rapid-fire, live-wire, entertaining,
amusing, and instructive series of Moving
Pictures.

Come and see in Animated Pictures how
the World's Greatest Popular Priced Car—the
New 1915 Maxwell \$695 Automobile
is made.

This "Wonder Car" with Electric Self-Starter and Electric
Lights only \$695.

Tickets of admission upon application

Everitt Auto Sales Co.
170 and 172 W. 4th St.
Columbus, Ohio

The Way they are Appreciated

Only a comparatively few dealers have had the opportunity of booking dates, but wherever shown, the "Maxwell Movies" are playing to record audiences—overflow houses crowd to see them.

The letter reproduced below is from a theatre owner in St. Clair, Michigan. Read it. Think of a crowd so immense that by jamming against the front of the theatre for the second show of the evening, they broke the glass in the poster frames.

ST. CLAIR, MICHIGAN,
Sept. 16th, 1914.

MAXWELL MOTOR SALES CORPORATION,
DETROIT, MICHIGAN.

Dear Sirs:—

On the 14th inst. your company leased my theatre to exhibit your film—"From Molten Steel to Automobile"—also to run two slides in advance. (I ran the slides one week in advance). Also to furnish poster frames on the day of the show which, I did. Owing to the immense crowd jamming into the front for the second show, they broke the glass out of two of the poster frames. Owing to the fact that you had them rented or leased, I am enclosing bill for same as I think you should pay for them. Your lecturer said to send you the bill and you would pay for the damage done. So please mail me my check by return mail for \$22.75, the amount being due me on lease of theatre and damage done to poster frames.

Hoping to hear favorably from you by return mail, I am,

Very truly yours,

(Signed) D. C. MILLS, *Manager,*
Surprise Theatre.



Coming to
Toledo
September 1st

The biggest and most fascinating Moving Pictures ever shown.

THE \$40,000 FIVE REEL FEATURE FILM SENSATION

Coming to
St. Louis
September 1st

The Greatest, most Fascinating, and most educational of all high-class Motion Pictures showing various phases and incidents of the Automobile Industry.

How the new Maxwell 1915 \$695 Car is made—the world's greatest automobile value.

A thrilling entertainment and exhibition crowded with exciting scenes and incidents.

This "Wonder Car" with Electric Self-Heater and Electric Lights only \$695.

Free Tickets upon Application

Colonial Motor Car Company
3948-50 Olive St.
St. Louis, Mo.

To-Night at
The Lyric Theatre

The \$40,000 Feature Film Sensation

The most interesting, vivid, fascinating, educational moving pictures ever exhibited

This fascinating educational production of the Maxwell Motor Co. has been seen and praised by thousands in many parts of the country.

Secure tickets from us to-day.

M. V. Hanson
Mentor, O.

Since the Days of Cleopatra Vehicles of Conveyance Have Been a Source of Pride

FROM the crowned heads of Europe who keep fleets of from eight to twenty motor cars for their own personal *entourage*, to the independent private citizen, all take pride in owning an automobile that not only acts well but looks well.

The Maxwell Company realized this universal characteristic. A motor car to be popular and salable must be handsome.

Three things enter into a Maxwell car which make it appeal to the purchaser's pride. Extreme European streamline design, handsome exterior finish, and comfortable riding qualities.

These, together with the Maxwell's ability to "hold the road at 50 miles an hour," to carry its passengers faithfully, safely and regularly to their destinations, at the minimum cost, make the Maxwell a sure seller wherever and whenever shown.

The truth of the statements made in these pages should make a mighty impression upon you. Does it?

Next week another advertisement, the same size as this, will appear in this paper for the purpose of giving you a more comprehensive insight into Maxwell methods. Read it.



1914

A Record Year and a Word of Appreciation

The rewards of organized effort and sincere ideals come slowly but surely. Continental has been twelve painstaking years in the creating of its world-wide reputation.

Yet when earned rewards do come, they come richly. One hundred and twenty-three manufacturers are today building into their product the certainty and the extra guarantee of goodness that Continental has been developing since the earliest days of the automobile industry.

More than eight thousand dealers are also sharing in this success. And a hundred thousand owners are more than Continentally satisfied.

To all—manufacturers, dealers, owners—the Continental Motor Manufacturing Company extends thanks; and the hearty promise of the continuation of Continental co-operation to the fullest measure for other and equally prosperous years.

Continental Motor Mfg. Co.

Largest Exclusive Motor Builders in the World

Detroit, Mich.

Factories: Detroit, Muskegon

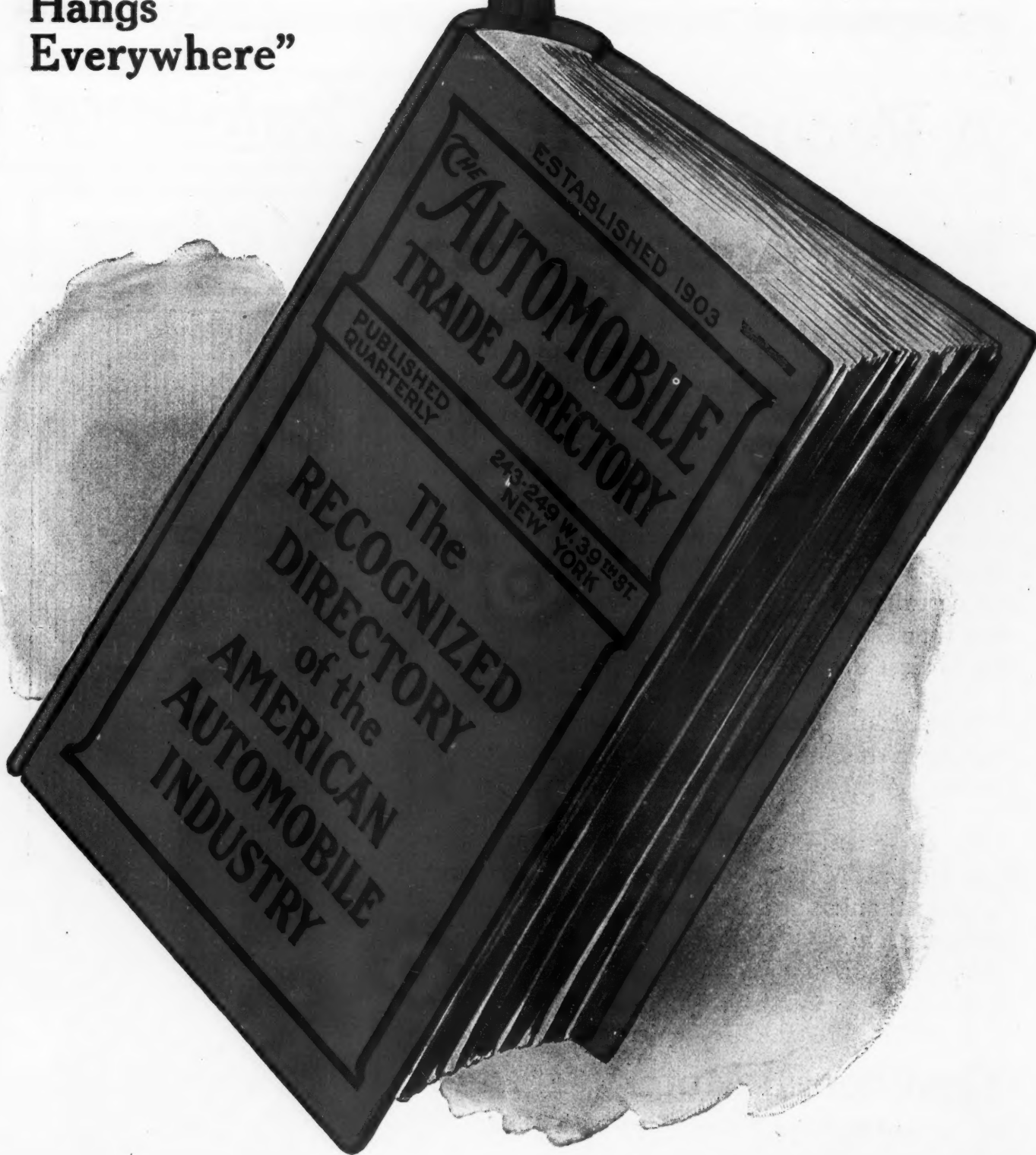
Continental

Motors

Used by 123
Manufacturers
of Pleasure and
Commercial
Vehicles.



**"It
Hangs
Everywhere"**



Forms Close December 22nd

ORDERS and change
of copy positively
must be received on
or before that date.

THE AUTOMOBILE
TRADE DIRECTORY
243-249 West 39th Street, New York

for the January Issue

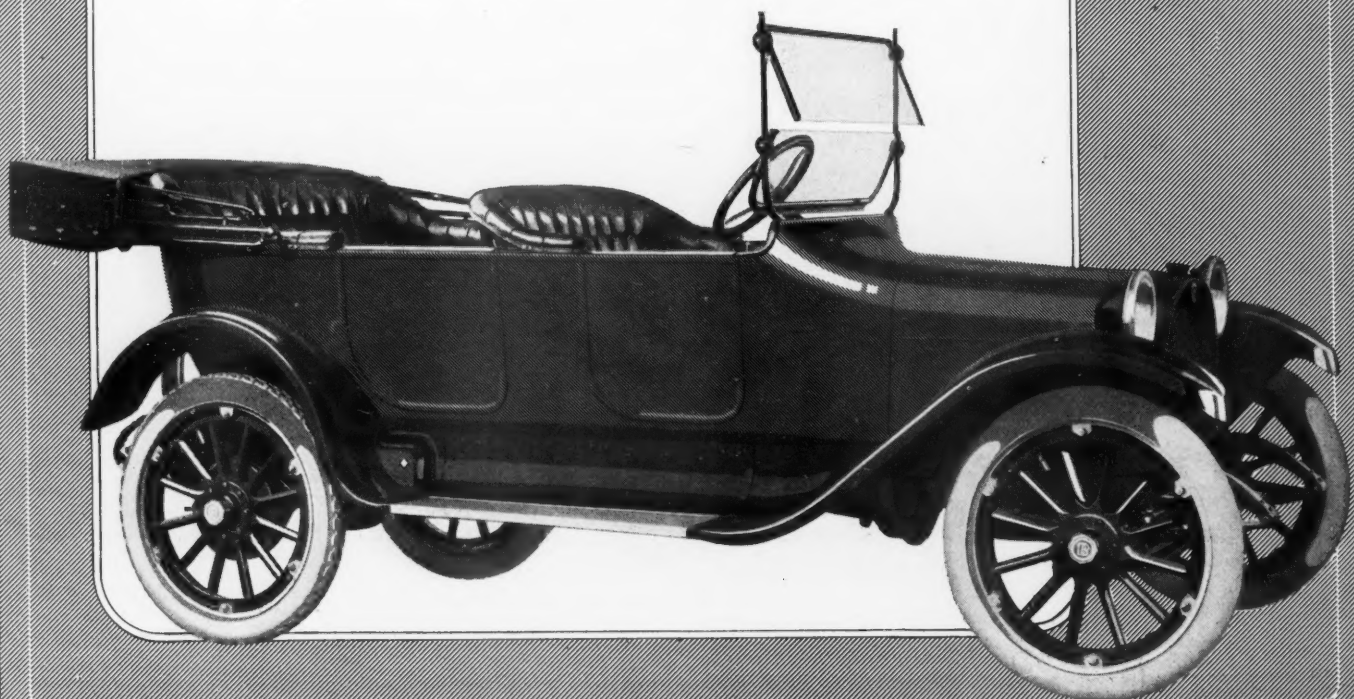
DODGE BROTHERS MOTOR CAR

Ordinary good practice
has not been good
enough—in every detail
you will find the ex-
ceptional.

The springs are made of chrome vanadium steel. The leaves are thinner because of the strength of this steel, and there are more of them. They are self-lubricating. The net result is maximum strength with maximum resiliency.

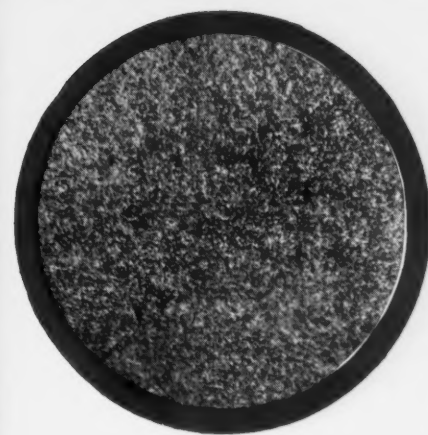
The price of the car complete is \$785
f. o. b. Detroit

DODGE BROTHERS, DETROIT



NEW DEPARTURE BALL BEARINGS

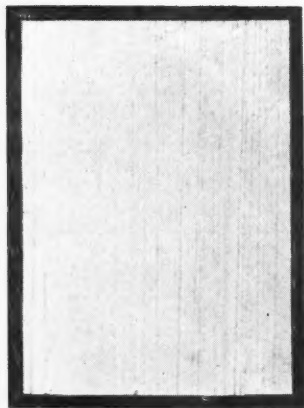
The Quality
Bearing of
the World



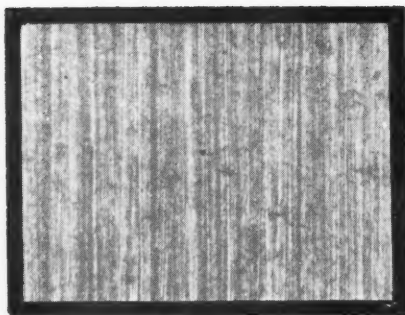
Photograph showing micro-structure of
the hardened New Departure Raceway.



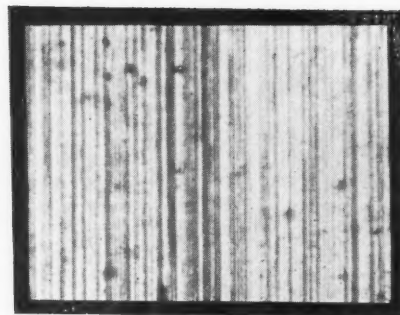
American Made
for American Trade



Micro-photograph of New Departure ball race, showing superiority of New Departure finish.



Micro-photograph of ball race of competitive bearing.



Micro-photograph of ball race of competitive bearing.

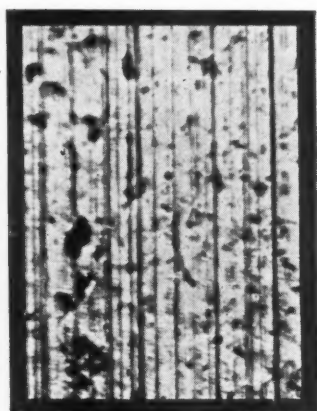
FAULTLESS steel, correct manufacture, and perfect finish of all working surfaces are the essentials in the making of an efficient ball bearing.

Fundamentally important is the steel. In the New Departure Ball Bearing of today the material is unsurpassed in all of the peculiar qualifications that have brought this American-made product to its present state of perfection.

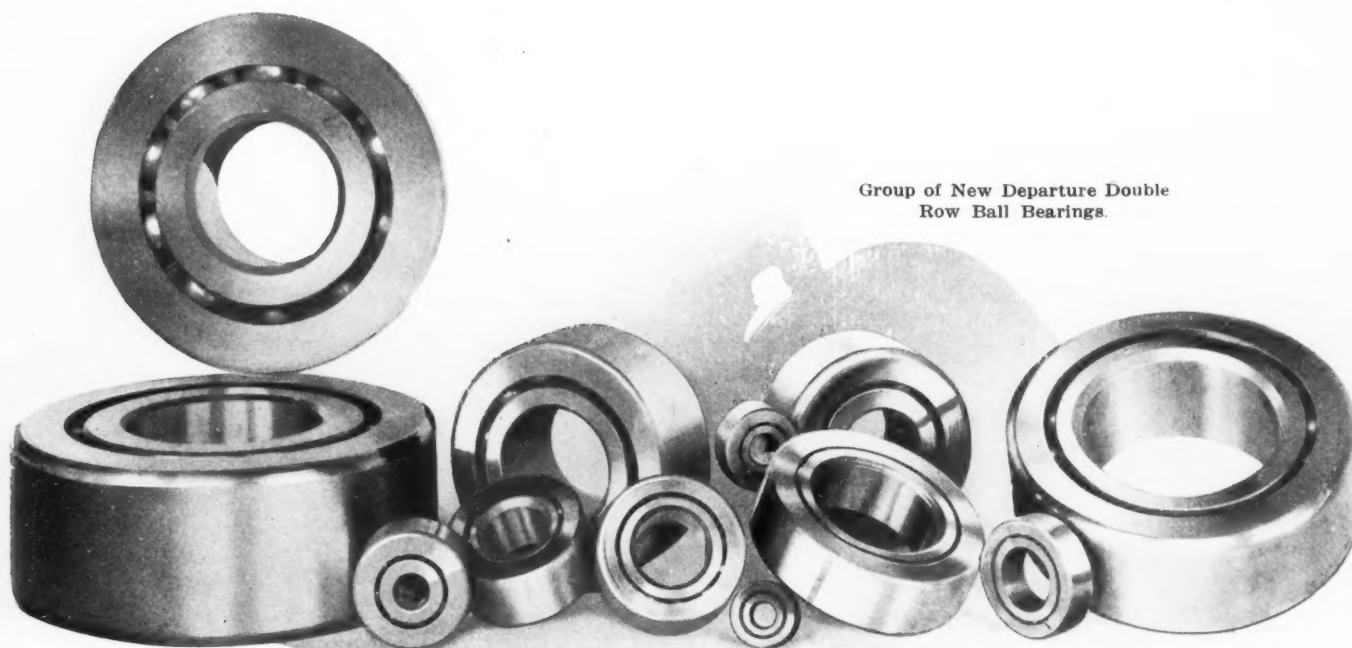
**NEW DEPARTURE
BALL BEARINGS
ARE MADE FROM
CHROME ALLOY
STEEL.**

This message to the trade seeks to inform regarding the success of this Company in developing the steel we are now using.

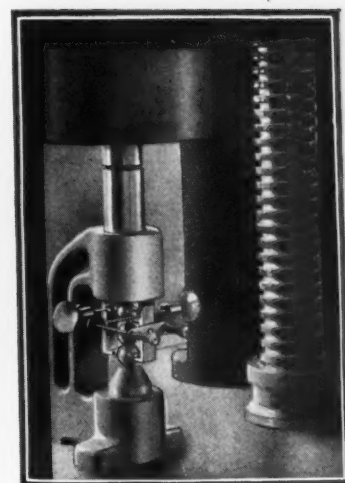
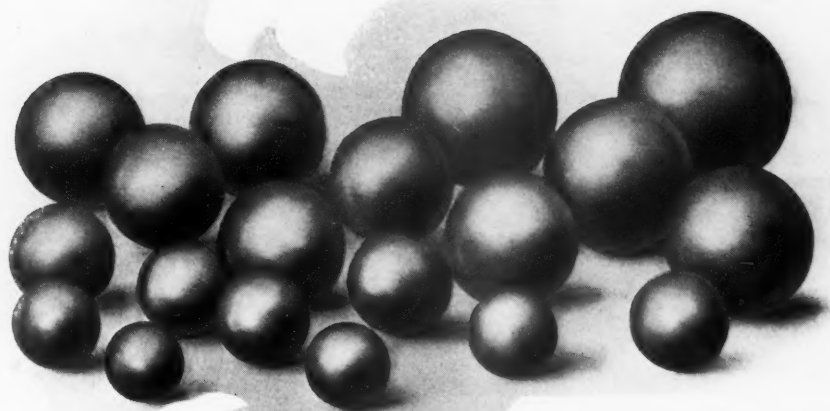
The story of this development not only covers almost countless experiments in our own laboratories, extending over a long period of years, but also includes the co-operation of many of the leading metallurgists of the steel industry.



Micro-photograph of ball race of competitive bearing.



Group of New Departure Double Row Ball Bearings.



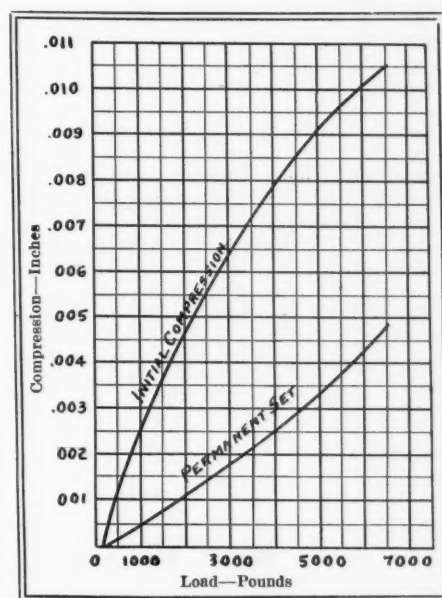
How the ductility of New Departure balls is determined.

After finally determining the ideal chemical composition of the chrome alloy steel for bearing purposes, our formulae are specified when ordering the tube or bar stock. Furthermore, a competent representative

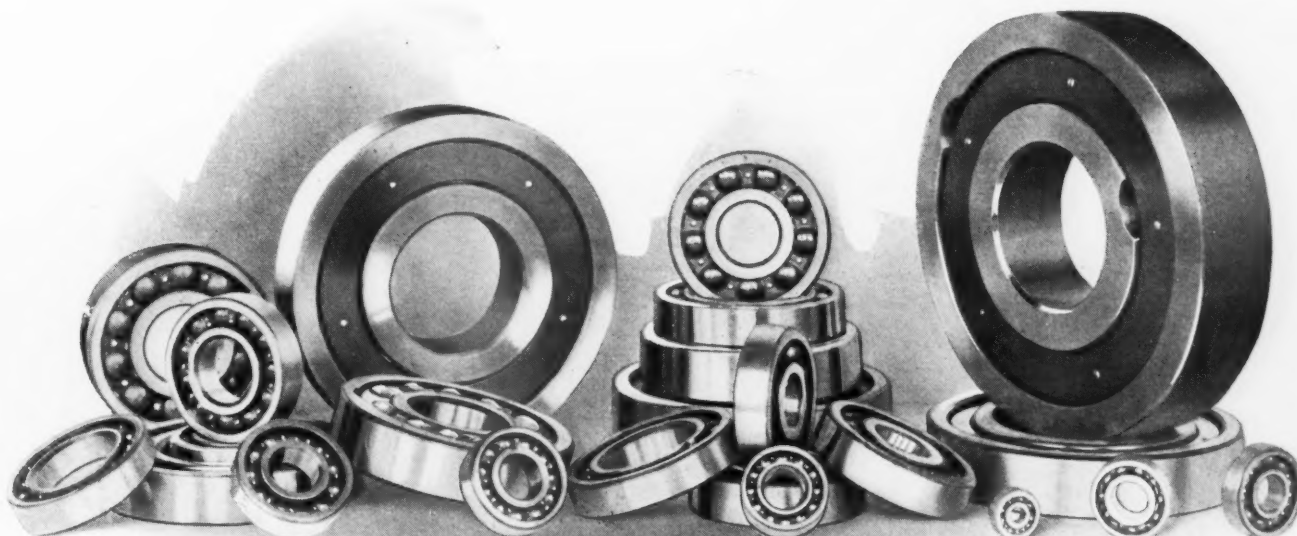
HOW THE RAW MATERIAL IS PRODUCED

of the metallurgical arm of our Engineering Department is placed in the mill during the processes of making the steel, as a safeguard against error or carelessness in carrying out our specifications.

When the steel arrives at our factory, before it is accepted, each mill heat is again carefully analyzed and tested by our chemists and metallurgists employing every method known to advanced science.

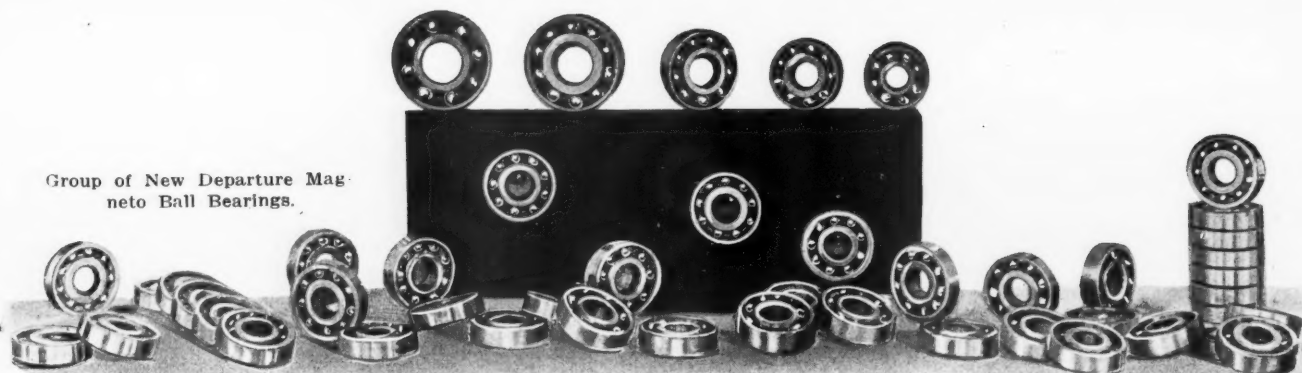


A typical New Departure ductility curve.



Group of New Departure Single Row Ball Bearings

Group of New Departure Magneto Ball Bearings.



This is done not only to ascertain whether the basic qualities of the material are acceptable, but to determine through a series of experiments just what heat treatment should be prescribed to intensify and perfect those qualities, to accord with established New Departure standards.

The character and the structure of the steel must be brought to a state of hardness, strength, and elasticity for withstanding the wear and shock to which the bearing will eventually be subjected in actual service.

Throughout the processes of machining, occurring before the bearing rings finally reach the heat treating furnaces, each part

**NEW DEPARTURE
ACCURACY UNDERLIES
NEW DEPARTURE
QUALITY**

is repeatedly and thoroughly inspected and tested.

In designing and building our heat treating plant an exhaustive study was made of every known type of furnace and of pyrometric control. Our present system of developing the steel is, therefore, exceptionally expert, modern and precise.

Following the heat treatment, come more laboratorial tests, microscopic examinations and inspection after inspection by trained experts, even to the final assembly of the parts in rooms that are dust tight, insure an ultimate quality that is unsurpassed.

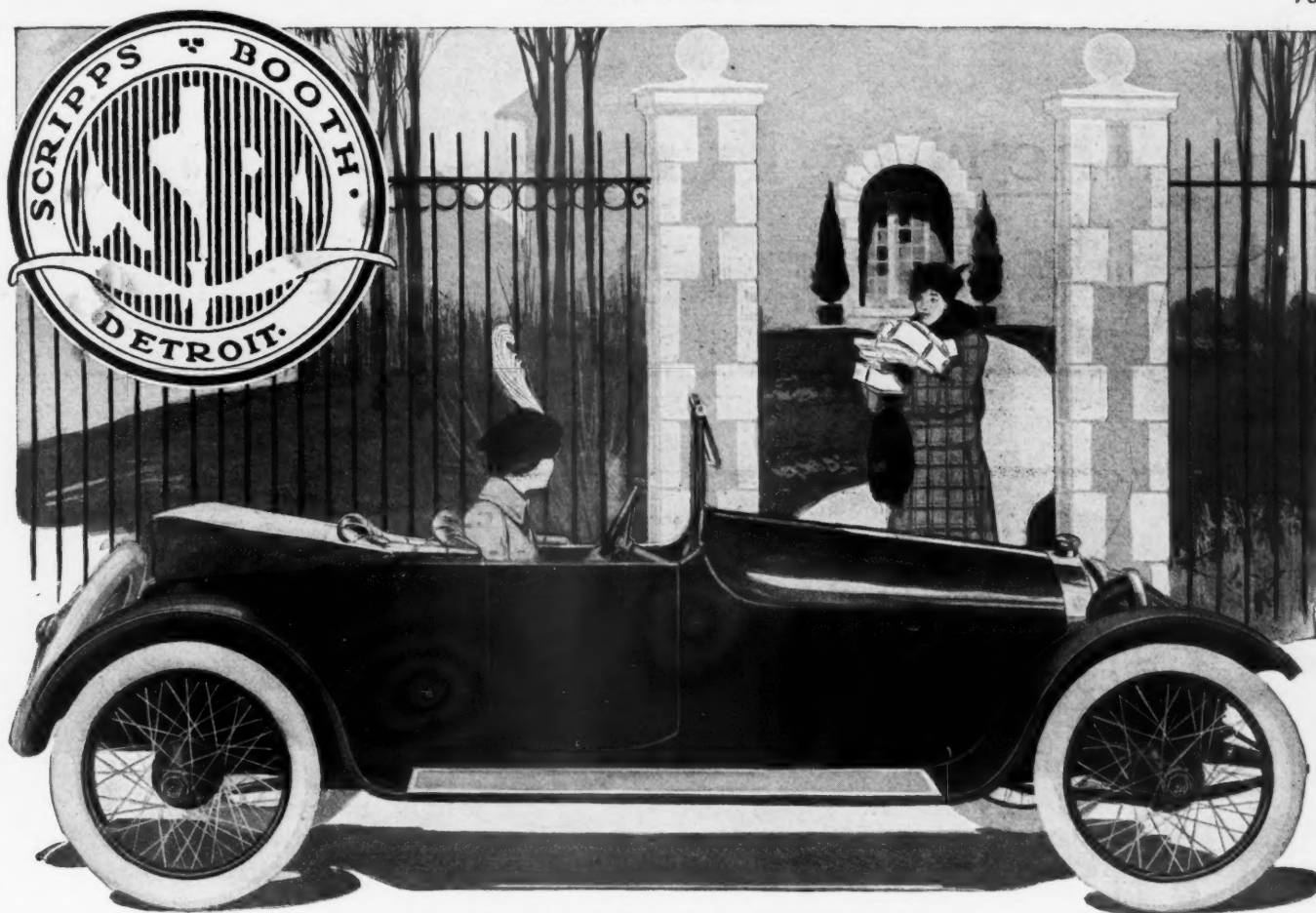
The New Departure Manufacturing Company

Bristol, Connecticut, U. S. A.

Western Branch, 1016-17 Ford Building, Detroit, Mich.



Group of New Departure Radax Ball Bearings



SCRIPPS BOOTH ROADSTER, \$775

SPECIFICATIONS:

110-inch wheelbase, three passenger car.

MECHANISM

Four-cylinder motor, three-speed gearset, shaft drive, bevel gear rear axle.

EQUIPMENT

Absolutely complete from electric self-starting and lighting system to electric door locks.

FINISH

Finest possible, both as regards upholstery, instruments, dash equipment and body finish.

DETAILS

Body—Streamline, torpedo stern, highest grade blue-black finish, domed fenders. Upholstery, finest quality long-grain buffed leather. Cowl dash instruments; sight feed oiler, lighting and dimming switches, starting strangler, starting and ignition switch, flush type speedometer, generator indicator, shroud light and foot space light.

WHEELS

Five Houk, triple-laced detachable wire, 30x 3½ inches, wide hubs.

AXLE

Rear, full-floating, annular bearings throughout. Bevel drive. Ball bearing universal joints on the Kardan shaft. All gears and shafts 3½% nickel steel. Drive shaft tubular.

GIFTS

One buys a car on a basis of expectancy. A certain amount of service, comfort and mileage is anticipated for the money paid.

An unexpected luxury or service which appears after the price is paid comes as a gift, an unanticipated good measure, and gives one the well-earned pride of a wise purchase.

SCRIPPS-BOOTH luxury sets a new standard in light vehicle construction and brings to the owner each day unexpected freedom from road discomforts and unanticipated driving joys:—surprise-gifts giving added value to thoughtful purchasing.

SPECIFICATIONS:**MOTOR**

Sterling, valve-in-head type, high speed, gearset in unit, pump feed oiling with sight feed on dash, 2½ bore, 4-inch stroke, four-cylinder, water cooled. Develops 18 horsepower. Fitted with Zenith carburetor and Atwater-Kent automatic spark advance, connected with starter generator system.

STARTING

Bijur single unit electric, connected by silent chain, operated by locking dash switch.

SPRINGS

Front, semi-elliptic with over-slung frame. Rear, floating cantilever.

EQUIPMENT

Silk mohair top with side curtains, rain vision plate glass windshield, electric door lock, Klaxet horn, full tool equipment, jack. Luggage space at the rear large enough for two suit-sizes and tools. Spare Houk wheel, tire and tube on all cars.

FEATURES

Klaxet button in center of steering wheel cannot be operated when ignition switch is off, eliminating miscellaneous horn blowing while the car is standing.

No projecting handles or slots in the doors. Electric door locks are operated by pressing a small push button.

SCRIPPS-BOOTH CO.



DETROIT, MICHIGAN

When Writing to Advertisers, Please Mention Motor Age.



OF COURSE YOU READ the big Reo announcement which appeared in more than one hundred newspapers—ten million combined circulation—all over America, last Sunday.

THAT SAME AD will appear this week in the leading national weeklies—Collier's, Leslie's, Literary Digest, S. E. Post, etc.—as well as in all the principal agricultural publications all over America.

PERHAPS YOU DID NOT KNOW that that is the largest individual automobile advertising campaign ever put out in this or any other country. The aggregate expenditure was something over \$80,000.00.

THE THIRD PARAGRAPH in that ad is one of the most remarkable statements ever made in an automobile ad and has created a tremendous sensation. The remarkable part of it is that it is true—as you have doubtless ascertained. If you haven't you ought to—just ask your banker.

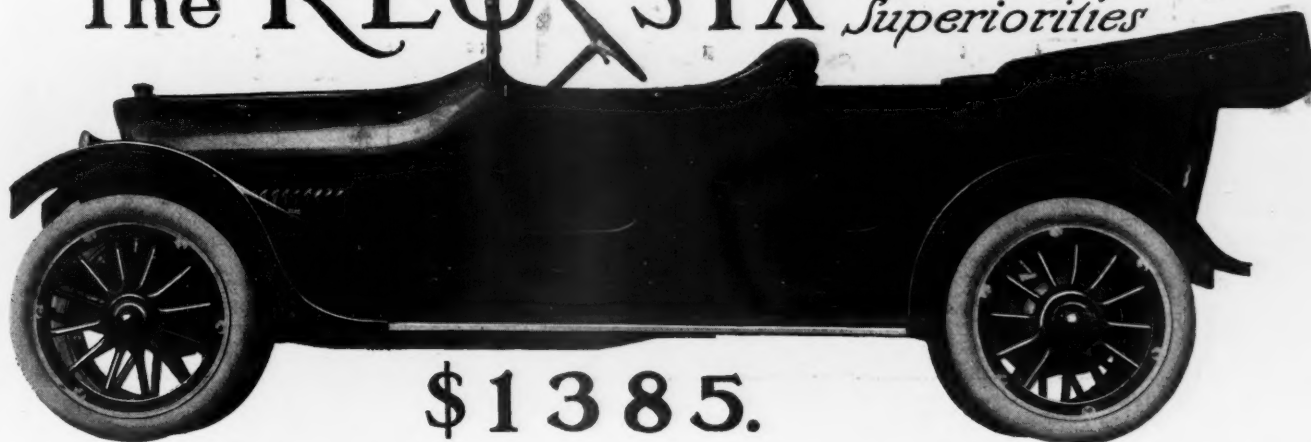
NOW THE REAL SIGNIFICANCE of that tremendous Reo advertising campaign to you as an automobile dealer, looking for a line that not only will sell but will stay sold, is that it indicates the Reo Company is now going to take the place that has always legitimately belonged to Reo. First place.

WE NEEDN'T SAY MORE HERE. On the opposite page you will find what you are looking for—detailed specifications of the new Reo models, the 1915 Reo the Fifth—the Incomparable "Four" and the Sensational Reo Six, about which the entire trade is talking at this moment.

LANSING IS THE MECCA for thousands of automobile dealers today. If you are looking for a chance to get on the band wagon—to get the one best seller for 1915—better get busy with the time table. "The dealer up street" may reach Lansing first.

REO MOTOR CAR CO., Lansing, Michigan, U.S.A.

The REO SIX *The Six of Sixty Superiorities*



\$1385.

Specifications

1915 Reo The Fifth, Model R Four
Price \$1050

Frame—Cold rolled pressed steel. Dimensions 5/32x 1½x3½.
Springs—Front—semi-elliptic—38x2 with 7 leaves. Rear—¾ elliptic—lower section 44½x2 with 7 leaves. Upper section 22½x2 with 7 leaves.
Front Axle—I-beam, drop forged, with Timken roller bearing spindles.
Rear Axle—Tubular—semi-floating. Timken roller bearings at differential—Hyatt High Duty roller bearings at wheels, pinion integral with stub shaft—two universal joints in propeller shaft—torque taken by separate torque arms—gear ratio 4-1.
Wheels—Wood, artillery type 34"x4", demountable rims.
Tires—34"x4" front and rear. Nobby Tread on rear.
Wheel Base—115 inches.
Motor—Vertical, four-cylinder, cast in pairs, modified L type with integral head, with inlet valve in head. Valves mechanically operated and protected. Exhaust valve seated directly in the cylinder. Barrel type crank case with three crank shaft bearings, each 1½" in diameter. Helical timing gears running in oil. Hardened and ground cam shaft with cams integral.
Cylinder Dimensions—4½x4½.
Horsepower—30-35.
Cooling System—Water jackets and tubular radiators, cellular pattern. Water circulation by centrifugal pump direct to exhaust valves.
Lubrication—Automatic force feed by plunger pump with return system.
Carburetor—Automatic heated by hot air and hot water.
Ignition—Combined generator and magneto, driven through timing gears with 100 ampere hour storage battery and emergency dry cells.
Starter—Electric, separate unit, six volt, worm gear connected to transmission.
Transmission—Selective swinging type with single rod center control.
Gear Changes—Three forward and reverse.
Drive—Shaft with two universal joints encased in oil, through bevel gears.
Clutch—Multiple dry disc, faced with asbestos with positive and instant release.
Brakes—Two on each rear wheel, one internal, one external, 14" diameter drums—service brake interconnected with clutch pedal.
Steering—Gear and sector with 17" steering wheel.
Control—Left-hand drive, center control—spark and throttle on steering post with foot accelerator.
Fenders, etc.—Drawn sheet steel of latest oval type—shield between running boards and body—close fitting, quick detachable under pan—aluminum bound, linoleum covered running boards.
Gasoline Capacity—16 gallons.
Water Capacity—3½ gallons.
Speed—40 to 45 miles per hour.
Body—Five-passenger—streamline touring car type with extra wide full "U" doors, front and rear. Genuine leather upholstery. Deep cushions and backs.
Finish—Body, Cobalt blue; running gear, black; equipment nickel trimmed.
Equipment—Fully electric lighted throughout, improved five-bow, one-man mohair top with full size side curtains, mohair slip cover; clear-vision, rain-vision, ventilating windshield; speedometer, electric horn, extra rim with improved tire brackets, pump, jack, complete tool and tire outfit, foot and robe rails.
Price—\$1050, f. o. b. Lansing, Michigan. Roadster \$1000. Four-passenger Coupe \$1575.

Specifications

1915 Reo The Six—Model M
Price \$1385

Frame—Cold rolled pressed steel. Dimensions 5/32x 1½x4½.
Springs—Front—Semi-elliptic—38x2 with 8 leaves. Rear—Cantilever—50½x2½ with 7 leaves.
Front Axle—I-beam, drop forged with Timken roller bearing spindles.
Rear Axle—Full floating. Timken roller bearings at differential and at wheels—two universal joints in propeller shaft—torque taken by separate torque arms—gear ratio 3.7 to 1.
Wheels—Wood, artillery type 34"x4", demountable rims.
Tires—34"x4" front and rear. Nobby Tread on rear.
Wheel Base—122 inches.
Motor—Vertical, six-cylinder, cast in threes, modified L type with integral head, with inlet valve in head. Valves mechanically operated and protected. Exhaust valve seated directly in the cylinder. Barrel type aluminum crank case with three crank shaft bearings. Dimensions of end bearing 1½", of center bearing 2". Helical timing gears running in oil. Hardened and ground cam shaft with cams integral.
Cylinder Dimensions—3½x5½".
Horsepower—40 to 45.
Cooling System—Water jackets and tubular radiator, cellular pattern. Water circulation by centrifugal pump direct to exhaust valves.
Lubrication—Automatic force feed by plunger pump with return system.
Carburetor—Automatic, heated by hot air and hot water.
Ignition—Combined generator and magneto, driven through timing gears with 100 ampere hour storage battery and emergency dry cells.
Starter—Electric, separate unit, worm gear connected to transmission.
Transmission—Selective swinging type with single rod center control.
Gear Changes—Three forward and reverse.
Drive—Shaft with two universal joints encased in oil, through spiral bevel gear.
Clutch—Multiple dry disc, faced with asbestos, with positive and instant release.
Brakes—Two on each rear wheel, one internal, one external, 14" diameter drums—service brake interconnected with clutch pedal.
Steering—Gear and sector with 18" steering wheel.
Control—Left hand drive, center control—spark and throttle on steering post with foot accelerator.
Fenders, Etc.—Drawn sheet steel of latest oval type—shield between running boards and body—close fitting, quick detachable under pan—aluminum bound, linoleum covered running boards.
Gasoline Capacity—16 gallons.
Water Capacity—4 gallons.
Speed—45 to 50 miles per hour.
Body—Five-passenger—streamline touring car type with extra wide full "U" doors, front and rear. Genuine leather upholstery. Deep cushions and backs.
Finish—Body, Cobalt blue—running gear, black—equipment nickel trimmed.
Equipment—Fully electric lighted throughout, improved 5-bow, one-man, mohair top with full size side curtains, mohair slip cover, clear-vision, rain-vision, ventilating windshield, speedometer, electric horn, extra rim with improved tire brackets, pump, jack, complete tool and tire outfit, foot and robe rails.
Price—\$1385, f. o. b. Lansing, Michigan.



ARGO

MOTOR-VIQUE

\$295

f.o.b. factory Top, windshield, headlights and generator attached, \$29 extra

Think of it! Here's a two-passenger four-cylinder motor-propelled vehicle—good looking, sturdy, durable and reliable—at the lowest first cost, the lowest operating cost, and the lowest upkeep cost in the history of the world. Remember the Motor-Vique is not a "cycle-car," full of freak notions, nor has it the complicated mechanism of an expensive automobile. It is a distinct type of vehicle, bringing motor transportation to the millions as no other car could do.

We didn't blow trumpets or beat drums before the Argo Motor-Vique was an accomplished fact. We have not promoted the idea, nor have we sought orders or selling contracts on the basis of what we hoped to accomplish.

We have put our money, and two years of the hardest kind of effort and experiment back of the Argo before we let a whisper of it get out to the general public.

For we had two problems to solve. First: To build a car to sell for less money than any motor car had ever sold before. Second—and this was far and away the hardest part—to build at such a price a car that would represent real motor transportation to millions of people unwilling or unable to pay more. When you examine the Argo you'll see how well we have succeeded—and we're content to rest on that.

The designers and inventors of the Argo (and it is covered by many patents) have been connected with the motor-car business practically since its inception.

The car originated in the workshops of Briscoe Freres, in Paris, France. In its first form, the Argo Motor-Vique was shown at the Paris Salon in October of 1913. It was the sensation of the show. During the seven days in which it was exhibited purchase offers were made for over 3,700.

The war, of course, held up European developments, but the work in the United States has been pushed forward as rapidly as the building of special machinery and the perfecting of manufacturing details would permit. The factories at Jackson are now equipped to produce 40 cars a day.

Enormous Market

It requires little thought to see that the Argo Motor-Vique has a sales field the like of which no motor vehicle ever approached before. No such chance for quick sales, big volume of business and sure profits has ever been offered to the dealer. At least one out of every twenty families is a possible purchaser of one or more cars, for literally the Argo Motor-Vique is

Cheaper Than Carfare

Read the detailed particulars on the next page. Consider the possible market in your own town. The Argo Motor-Vique is without exaggeration the greatest proposition ever offered to dealer or public.

Benj. Briscoe, President.

ARGO MOTOR COMPANY, Inc., JACKSON, MICHIGAN
NEW YORK SHOW, Space C7, Third Floor **CHICAGO SHOW, Space 3, Basement**

A Car for Which a Million Buyers Are Waiting

We shall tell the public about the Argo Motor-Vique during the coming year in a good-sized national advertising campaign reaching every hamlet in the country. In addition to the general public demand, the Argo Motor-Vique appeals with special force to the following classes:

First—Owners of larger cars who recognize the folly of using a big car for errand work, but need a motor vehicle for such service and who as sensible men study cost and aim to be reasonably economical.

Second—A large class made up of physicians, contractors, salesmen, merchants; in fact, any class who have to go about from place to place and for whom a horse and buggy is too slow and a large car too expensive or unwieldy.

Third—Farmers who need transportation to and from town and around the neighborhood, both for themselves and their hired help. The use of the Argo will permit them

to keep their horses for the work for which they are intended.

Fourth—Mechanics, clerks, etc., going to and from their work, for where the distance is not greater than four or five miles, transportation by the Argo Motor-Vique will compare favorably with street car or steam road fare.

Fifth—The young people going to and from their schools, their recreation grounds, etc.

Sixth—And that great class of people not enumerated above, but who have things to do at distances from home and whose time is valuable; or who would enjoy motoring if they could do so in comfort at small cost.

Automobile, Motorcycle, Implement or Hardware Dealers Wanted Everywhere

As quickly as possible we want nation-wide reputation for the Argo Motor-Vique. There's no need to dwell any further upon its possibilities for the dealer—your own common-sense will tell you more than we could say.

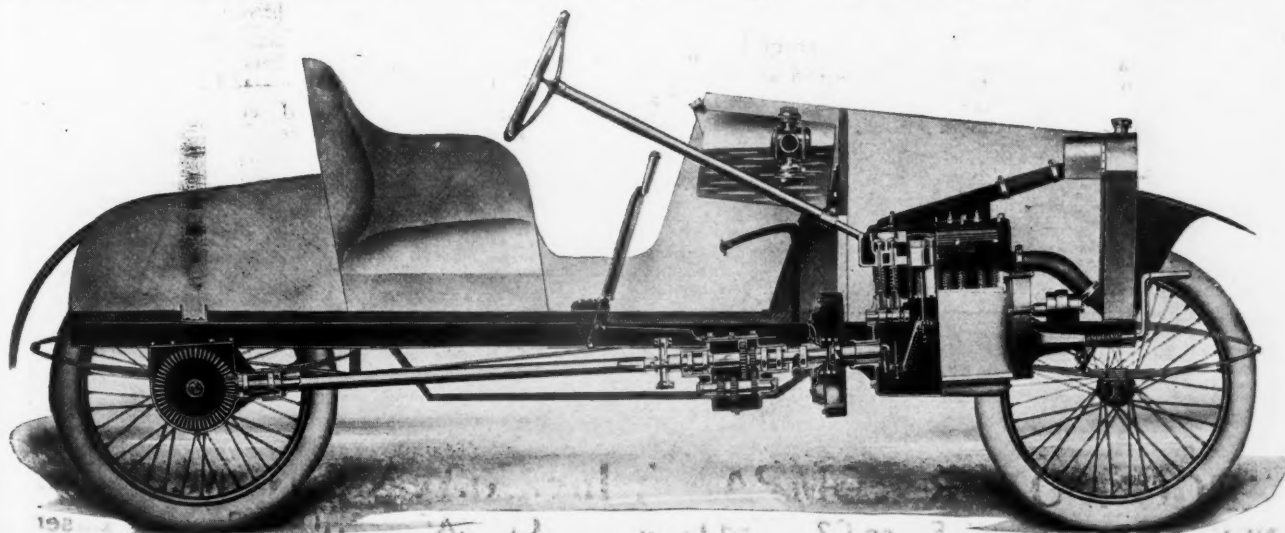
So, it's going to be a case of "first come, first served." Write or wire in what territory you want and what you are now doing. Figure your allotment on a basis of one car per year for every 250 of population. For that is approximately what we shall ask you to contract for.

But get busy. Eliminating all "hot air," this is the chance of a lifetime for a live man.

Specifications

Motor: Briscoe Freres I-head type; 24x4; 4 cylinders cast en bloc; 3-point suspension. **Cooling:** Thermosiphon system, standard honeycomb radiator. **Clutch:** Internal cone type, leather faced. **Transmission:** Sliding gear, two speeds forward, and reverse. **Axle:** Front, I-beam, rear Argo special. **Drive:** Shaft, through universal joint. **Bearings:** Ball bearing complete from engine to wheels. **Springs:** Full elliptic front and rear. **Brakes:** External contracting. **Carburetion:** Standard automatic type. **Lubrication:** Self-contained constant-level splash system; sight gauge on dash. **Ignition:** Timer distributor of great battery economy, suitable in quality for a \$3,000 car. **Frame:** Pressed steel channel. **Wheels:** Wire, clincher-rim; 90-inch wheelbase, 44-inch tread. **Tires:** 28-inch. **Control:** Single pedal, spark and throttle on steering column. **Body:** Dark finish, two-passenger; seat 24x42 inches; leg room 38 inches. **Gasoline:** 6-gallon tank, gravity feed to carburetor; 35 to 40 miles per gallon; speed 5 to 40 miles per hour. **Equipment:** Two side oil lamps, oil tail lamp, horn and tools. Headlights, top, windshield and generator attached, \$29 extra.

ARGO MOTOR COMPANY, Inc., JACKSON, MICHIGAN



When Writing to Advertisers, Please Mention Motor Age.



Polarine
FRICTION REDUCING MOTOR OIL

A CAR in commission all winter. No lapse of service through coldest weather if you use POLARINE.

Maintains the correct lubricating body at any speed or temperature. Liquid at zero. POLARINE obviates a host of winter troubles.

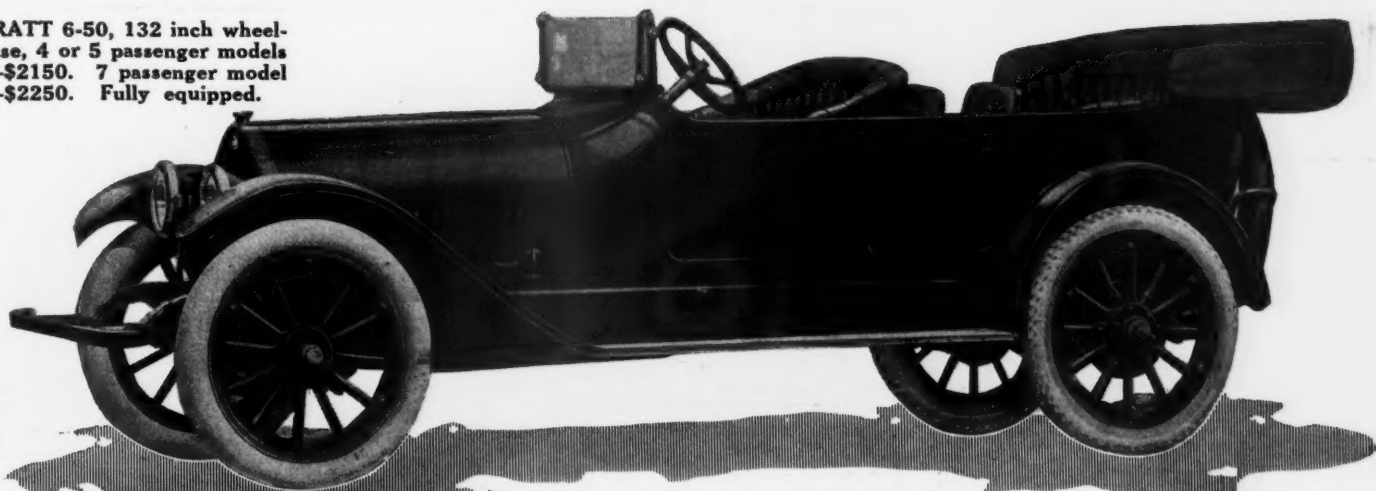
The result of fifty years' exclusive oil experience, master methods and equipment. When a better oil can be made we will make it.



RED CROWN
GASOLINE
Car and money
go farther

STANDARD OIL COMPANY
(AN INDIANA CORPORATION)

PRATT 6-50, 132 inch wheel-
base, 4 or 5 passenger models
—\$2150. 7 passenger model
—\$2250. Fully equipped.



Our new 6-50 Model for 1915 represents in concentrated form all that has gone towards making PRATT synonymous with success throughout the last 7 years. Perfected and refined to the slightest detail—embracing standardized constructional units of proved supremacy only—a masterpiece of body design—fully equipped with the latest approved luxuries and conveniences—and priced at \$2150, it challenges cars selling at hundreds of dollars above its price class.

1915—PRATT—1915

Backed by 7 Years' Reputation for Quality

There is not an experimental bolt in PRATT construction. Every important part is the product of a leading specialist.—Continental Motor, Brown-Lipe Transmission, Fedders Radiator, Atwater-Kent Ignition System, Gray & Davis Starting and Lighting System, Rayfield Carburetor, Spicer Universal Joints, Timken Axles and Bearings, Goodyear Tires, Kellogg Tire Pump, Jones Speedometer. Consider what this list means. Write for detailed specifications and complete information.

DEALERS: We want live local dealers everywhere for direct connections. We do not operate through state agencies. You benefit through this arrangement. Write for agency proposition.

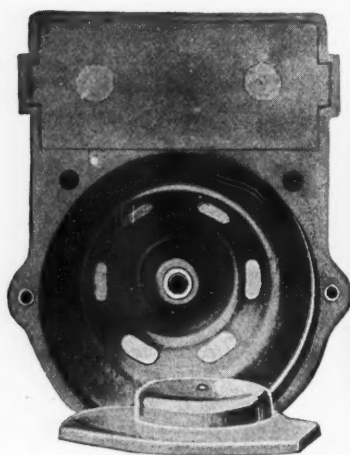
*We will exhibit in the Armory at the Chicago
Automobile Show, Jan. 23rd to 30th*

**ELKHART CARRIAGE & HARNESS
MANUFACTURING CO.**

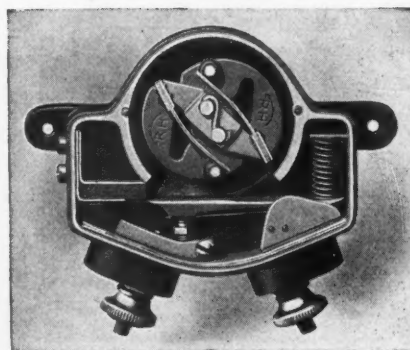
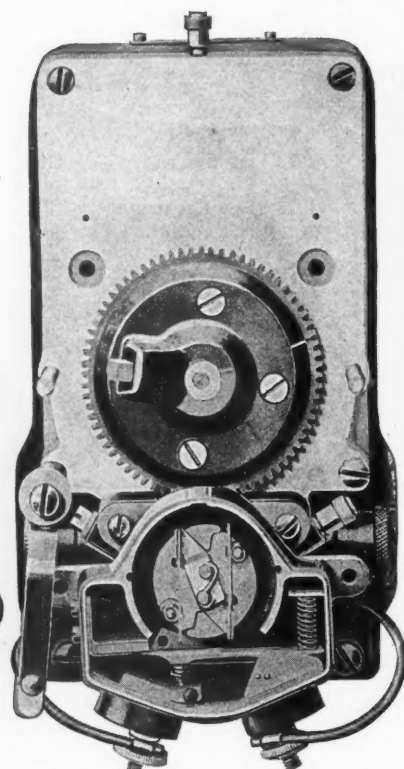
ELKHART, INDIANA

Westinghouse Electric Ignition

The Ignition Coil is an integral part of Westinghouse Ignition and Lighting Generators.



Ignition and Lighting Generator with Distributor and Interrupter Cover removed. Interrupter at rest.



Showing position of Interrupter Parts at High Speed.

Automatic Spark Control is Westinghouse practice. Note the two positions of interrupter parts, at rest and at high speed.

Some Other Advantages:

A Single Unit for Ignition and Lighting.
Constant intensity of spark at all speeds.
Greatest Horsepower;—least fuel consumption.
Interrupter has constant time of contact.
Distributor removable without removing brushes.

Westinghouse Electric & Manufacturing Co.

Sales Offices in All
Large American Cities

Automobile Equipment Division

East Pittsburgh
Pennsylvania



EISEMANN

Indicative of the determination of the Eisemann Magneto Company to take care of American manufacturers without delay, announcement is made of another increase of the present large factory.

Last summer, long before hostilities broke out in Europe, an increase of more than a third additional space was arranged for. This has just been occupied with full equipment for manufacturing. But with recent developments even this space was insufficient for us to keep up with growing demands. So we have just started upon an even larger increase of manufacturing space and facilities which we will occupy within a very few weeks.

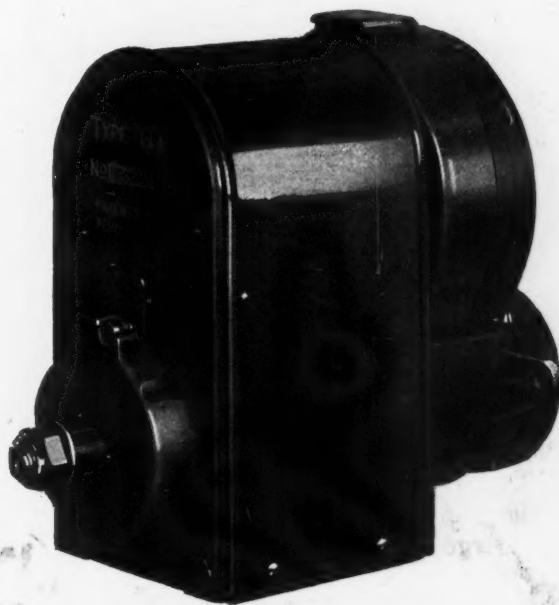
While some of this demand for Eisemann instruments has been occasioned by war conditions, that have not affected our products, the greatest proportion of it is a natural growth as a result of the realization on the part of car makers, of an unquestioned supremacy of Eisemann products from a standpoint of efficiency, durability and dependability.

Additions to Eisemann Factory

The Eisemann Magneto Co.

Sales and General Offices
32-33d St., Brooklyn, N. Y.

New York	Indianapolis, Ind.	Detroit, Mich.
123 W. 52d St.	415-417 N. Capitol Ave.	862 Woodward Ave.





WHERE GREEK MEETS GREEK WHERE AUTOMOBILE MEN FROM THE ENTIRE UNITED STATES GATHER TO TALK "SHOP."

When the doors open at the Grand Central Palace to display to the world the highest achievements of the American automobile industry, every room in the world-famous Hotel Martinique will be filled with automobile men.

Year after year they have gathered here in increasing numbers, until today no hotel in New York, or in fact elsewhere in the world, with the possible exception of one fine hostelry in Detroit, can be said to be such a mecca for the men who make and sell automobiles.

Make reservations now if you want to be located in the midst of the men you care to meet at this year's automobile show.

\$2.50 Per Day A pleasant room with private bath facing large open court.

(Not one room, but one hundred of them.)

\$3.00 Per Day An excellent room with private bath facing street, southern exposure.

(Not one room, but eighty-seven of them.)

Also attractive Room without Bath, **\$1.50** per day. The Restaurant prices are most moderate.

THE HOTEL MARTINIQUE

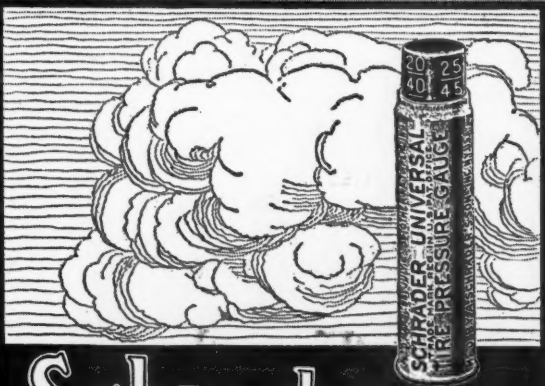
"The House of Taylor"

On Broadway 32d to 33d Street, New York

CHARLES LEIGH TAYLOR, President

WALTER CHANDLER, Jr., General Manager

WALTER S. GILSON, Vice President



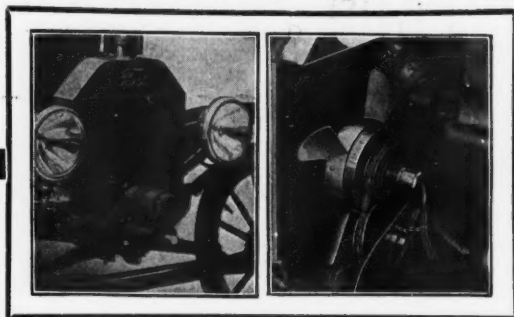
Schrader

A TIRE begins to overwork and overwear the minute the air pressure in it falls short of the inflation prescribed for it by its makers. There is no method yet discovered of ascertaining the pressure in the inside of a tire except by the use of a pressure gauge. A casing containing 40 lbs. of air looks and feels exactly like a casing containing 80 lbs. If your tires require 80 lbs. and you only give them 40, they're on the quick road to the scrap heap.

USE A
SCHRADER
UNIVERSAL TIRE PRESSURE GAUGE
and save your tires
PRICE \$1.00

For sale by Tire Manufacturers, Jobbers, Dealers, Garages, or
A. SCHRADER'S SON, Inc.
783-791 Atlantic Ave. Brooklyn, N. Y.

Two-Unit **Kemco** Electric STARTING-LIGHTING SYSTEM



The Most Practical Ford Starter

Therefore the most reliable. You get positive results from the Kemco system under the most adverse conditions. It is a two-unit system, designed right, built right and applied right.

Starter—Powerful enough for any emergency. Acts directly on crankshaft WITHOUT CHAINS.

Dynamo—Best ever built. Replaces Ford fan. Provides ample current at low car speeds for all needs.

Outfit, including everything necessary—lamps, battery, switches, wire, etc., \$110 F. O. B. Cleveland, O.

The Kemco Elec. Mfg. Co. 2233 Ashland Road
Cleveland, Ohio

Real Service Efficiency

WE are constantly searching out the best establishments in the country to uphold Auto-Lite service ideals. They are not easily found.

Auto-Lite traveling representatives are always working diligently and persistently towards this end. Rapidly, but carefully, they are adding new links to our transcontinental chain of service stations. Nothing is left undone to bring Auto-Lite service to the highest possible point of efficiency.

This is in spite of the fact that less than 2 per cent of all Electric Auto-Lite systems in existence have ever required service.

The Electric Auto-Lite Company

Home Office and Factory: Toledo, Ohio

New York

Detroit

Kansas City

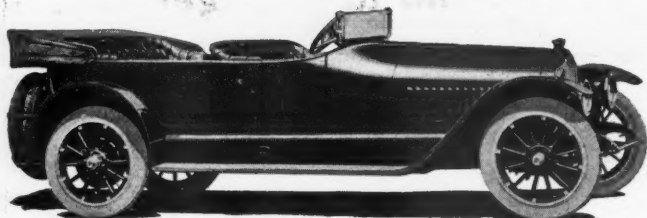
San Francisco

Electric Auto-Lite

STARTING - LIGHTING - IGNITION

National

SIX—\$2375

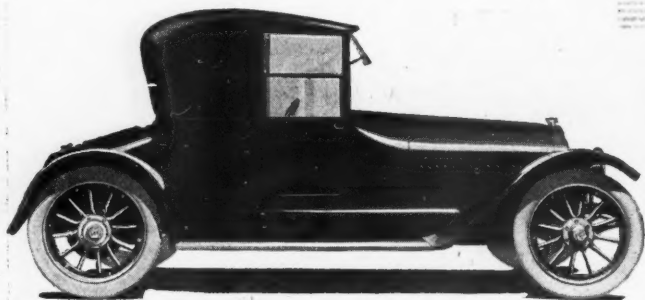


The Beauty of Distinction

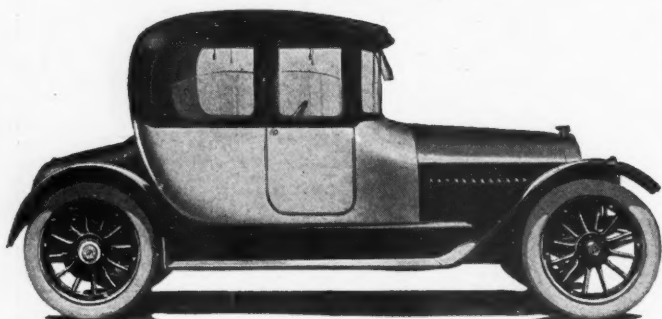
MEN or women of means to whom the latest and best in styles of wearing apparel is natural (without straining for effect) spontaneously approve the *National's* advanced design and superior structure.

It harmonizes with their personal appearance and speaks eloquently of their tastes and sound judgment.

The beauty of this car is not a mere veneer. Its ease and quietness in operation is the natural result of perfected machinery.



National Six. Cabriolet—\$2700



National Six. Coupe—\$2800

Series AA. Made in 2, 4 or 5 Pass. Styles, \$2375. Six Pass. Aisle-way, \$2850

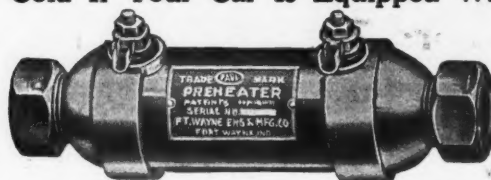
National Sixes develop any part of 55 H. P. at a fuel efficiency up to 17 miles per gallon

NATIONAL MOTOR VEHICLE CO.
INDIANAPOLIS INDIANA

When Writing to Advertisers, Please Mention Motor Age.

The Motorist's Winter Friend

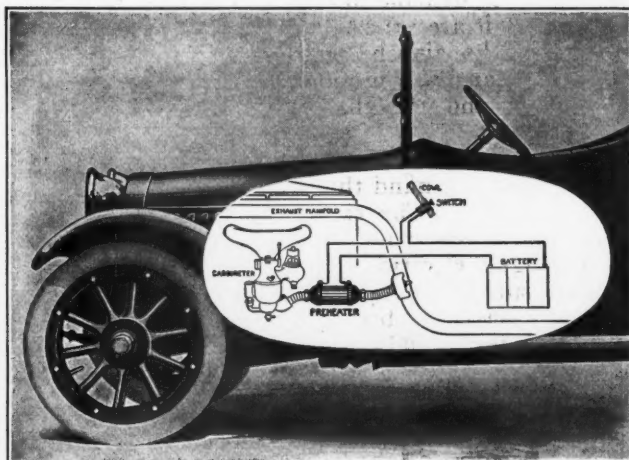
You Can Start Your Motor Easily When It's Cold If Your Car Is Equipped With a



PAUL
CARBURETOR
— AIR —
PREHEATER

PATENTS PENDING

"INSURES QUICK STARTING IN ZERO WEATHER"



METHOD OF INSTALLATION AND WIRING
DIAGRAM. ANYONE CAN INSTALL IT
—ANYONE CAN OPERATE IT

The Paul carburetor air PREHEATER is an electric heater, quickly attached to the fixed air intake of the carburetor. It heats the air before passing into the carburetor and is operated by the starting battery of the automobile or from any six volt source. It is turned on for starting only.

Every motorist knows that starting in cold weather is extremely difficult because gasoline does not vaporize readily at low temperatures. With a Paul PREHEATER vaporization is absolutely insured.

You Can Let Your Car Stand Indefinitely

Prolongs battery life with electric starters.
Eliminates excessive pressure with air starters.
Eliminates long and tiresome cranking with hand cranked motors.

Price, complete with Cowl Switch, 15 feet of wire and full instructions for installing and operating.....\$8.00

Delivered any part U. S. A.

Write for FREE descriptive booklet No. 4071

Agents wanted in every city

MANUFACTURED BY

Fort Wayne Engineering & Mfg. Co.
FORT WAYNE, IND.

Right in Your Neighborhood—you will find a Ford car equipped with



ROAD SMOOTHERS

(Reg. U. S. Pat. Off.)

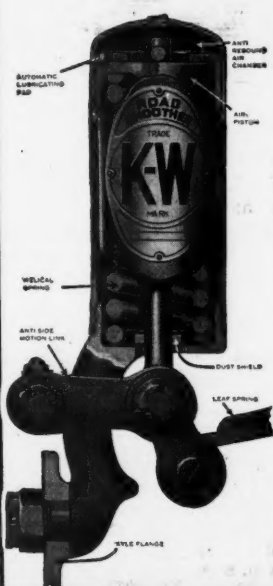
Quickly Applied to Your Ford Car

Ask the owner what they are doing for him every day.

He can tell you better than we how they smooth out the roughest roads, save the parts of your car—and about their reliability.

What you demand first is comfort. The reasons you get it are—the helical spring that takes up shock; the air chamber that checks rebound, and the anti-side-motion links that prevent side rocking and the chassis from getting out of alignment.

Next, you demand that this comfort be reliable and lasting. The reasons it is permanent are also K-W reasons—high grade heat-treated drop forgings; electric smelted chrome vanadium steel springs (not ordinary spring steel); extra heavy phosphor bronze bushings, and all thoroughly tested and perfectly built.



Beware of Imitations

The K-W is the only Road Smoother. K-W Road Smoothers are sold by dealers who know the difference, everywhere, at one price.

\$15

Set of Four
One for Each Wheel

If your dealer cannot supply you sent direct on receipt of price. Write for booklet, "Taking Out the Bumps."

HEADLIGHTING
OUTFITS

THE K-W IGNITION CO.
2835 CHESTER AVE.
CLEVELAND, OHIO, U.S.A.

SPARK COILS
SPARK PLUGS

GABRIEL SNUBBERS

*Make your car ride easy
and last longer*

Ask the engineers of your car or any Snubber user you meet. You will then understand why Snubbers are—

Standard

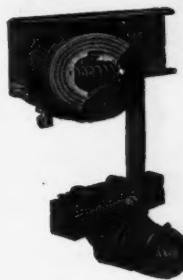
factory equipment on the easiest-riding cars, including Chalmers, White, Stearns-Knight, Peerless and Lozier,

And

partial or special equipment on more than twenty other leaders,

And the Only

device that effectively prevents the extreme up-and-down swing of long, flexible springs now so generally used—no matter how lightly laden may be the car.



As the springs compress, the slack belting is drawn into the coil: as they start to expand, friction within the coil retards outgo of belting and prevents sudden or excessive expansion of the springs.

Snubbers make your car run quieter, and are themselves noiseless. They require no re-adjusting and outlast the car.

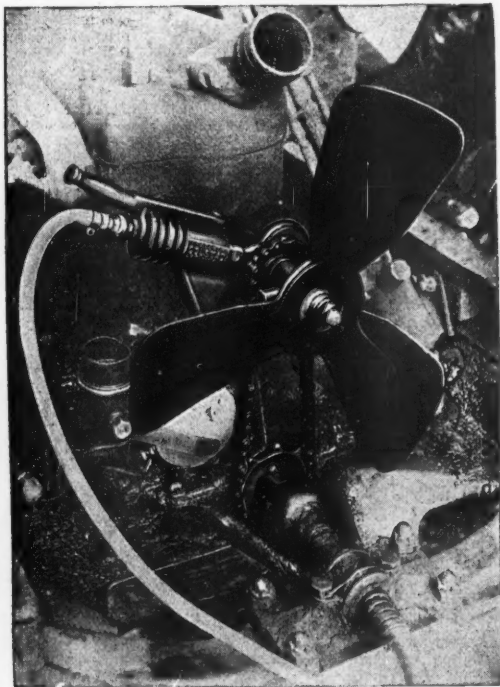
Tell us model of your car and let us send prices, literature and name of nearest distributor.

Gabriel Horn Mfg. Company
1415 E. 40th St. Cleveland, O.

GABRIEL SNUBBERS

The Improved **COLSTAD** Power Tire Pump For Ford Cars

THE COLSTAD Pump is the result of three years experimenting, during which time we have tested and discarded belt and split gear drives, *perfecting a positive and silent chain drive.*



The COLSTAD is easily put on without any machine work. It will pump up a Ford tire in two to three minutes. The pump cannot slip nor fail in operation under any conditions.

With each pump we supply an improved fan, which by reason of its greater size and volume, will remedy overheating troubles.

The COLSTAD is the original Ford Power Pump.

It is made in a thoroughly workmanlike manner, of the best material. Fully guaranteed by us.

Price \$10

Complete with Rubber Hose and Fan

SPECIALTY SALES COMPANY

Sole Distributors
2 Park Square, Boston, Mass.

GUARANTEED ONE YEAR


DOUBLE STONE Insulation. PLATINUM-ALLOY Electrodes. FOUR SPARKING POINTS. SELF CLEANING. Price, \$1.50. Order from your dealer or
HERZ & CO., 245 W. 55th St. (Nr. Broadway), New York

For the Cowl or Dashboard—

Weston

MODEL 301

Ammeters



Specially built for continuous reliability in automobile service. Weston improvements and minute attention to the perfecting of detail have raised them far above any other small instruments in accuracy, durability, appearance. Despite its high standard of service, Weston Model 301 is surprisingly inexpensive.

Weston Electrical Instrument Co., Newark, N. J.

New York	Boston	San Francisco	Atlanta	Berlin
Chicago	St. Louis	Detroit	Richmond	London
Philadelphia	Denver	Cleveland	Toronto	



**THINK THOUSANDS OF MILES
AHEAD, AND YOU WILL BUY
REPUBLIC MILEAGE
PLAIN AND STAGGARD TREAD
TIRES**

THE REPUBLIC RUBBER CO.
YOUNGSTOWN, OHIO.
 BRANCHES AND AGENCIES IN THE PRINCIPAL CITIES.

Overcooled Motors Waste Gasoline

Gasoline of the present low grade requires more heat to vaporize it than formerly, and often during the cooler months, one-third of the fuel passes through the motor unburned and wasted.

Summer conditions may be reproduced under the hood by use of the Boyce Motometer.

Overheated Motors Cause Repairs

No matter how perfect the mechanism of your car, when once starved of oil or water, it is headed straight for the repair shop.

"The careful and observing driver who wishes at all times to have accurate knowledge of motor heat and to run his motor under as nearly ideal conditions as possible, winter and summer, will find the Motometer a convenient aid." Extract from advice to dealers by one of the largest manufacturers in America.

Standard model \$10.00, Junior model \$5.00, Ford Special \$5.50. Write for circular, and let us tell you where our representative will put one on your car for a 30 days' trial. A few important territories are still open for representatives. Write at once.

THE MOTOMETER CO., Inc.,
1790 Broadway, New York City.

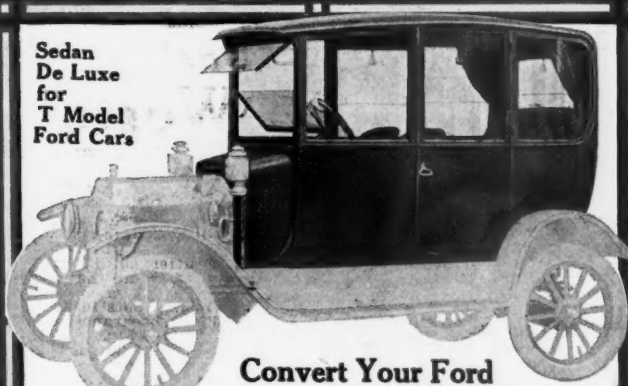
**BOYCE
MOTOMETER**

Makes
the Motor
damage-
proof

New York show—Booth D
Chicago show—Booth 104, Coliseum Annex



Sedan
De Luxe
for
T Model
Ford Cars



**Convert Your Ford
into a year 'round car**

Be prepared for the cold, rainy or wintry days ahead by making your Ford a ROBBINSFord. This design is by far the most handsomely appointed closed car in the special body field. It seats five passengers without crowding; has luxuriously upholstered seats; electric dome lights; floors richly carpeted and is in every respect a worthy member of the popular

**ROBBINSFord
LINE**

of Standardized Bodies for Ford Cars

You can now take your Ford to a Local Dealer—and in a few hours' time he will return it—completely transformed into a ROBBINSFord. Tell us what style body you prefer—a Coupe, Sedan or Commercial body—and we'll send the name of nearest dealer. Write TODAY giving the name of the man or firm you usually do business with and we'll send you descriptive literature and prices by return mail.

IRVIN ROBBINS & COMPANY
10th Street and Canal, Indianapolis, U. S. A.

KOEHLER ONE TON TRUCK \$750

GREATEST VALUE AT THE PRICE • LOWEST PRICE • CAPACITY



Here are brief specifications: Motor 24 h. p. Water Cooled, 4 Cycle, Ignition, High Tension magneto, Tires 36 in., solid standard removable, also Non-Skid Demountable Pneumatic Tires Optional at extra price. Tread 58 inches, Axles 2 inches square, rear 1 1/2 inch front. Transmission proved right by years of use, runs in oil bath.

TEN BODY TYPES

KOEHLER \$750

ONE TON TRUCK

SEND FOR CATALOGUE

DEALERS



Another Koehler Model that looks twice the price

How about your city or town—is it Koehlerized, or waiting for someone to reap a harvest from sales? Will it be you, or one of your competitors, who will make it hard for anyone else to sell any other make of truck? The Koehler is a great money-maker for dealers, being the lowest priced ton truck and giving greatest value at any price.

OUR TRAVELING REPRESENTATIVES ARE NOW COVERING THE ENTIRE COUNTRY and each has a truck with him. Notify us at once if you are interested, as a representative may now be in your section. You do not want to miss a chance to see this truck. Our complete catalog and selling plan should be in your hands—send for these.

H. J. KOEHLER S. G. CO.,
261 Halsey St., NEWARK, N. J.

KOEHLER ONE TON TRUCK \$750

XCEL-O-LYTE

Lighting System

\$50.00

FOR FORDS

**A Real Lighting System
ABSOLUTELY GUARANTEED**



Consisting of: Motor-type generator, latest design, 10 in. black and nickel double bulb head lights, 16 C. P. bulb for driving, 4 C. P. bulb for dimming and standing light, 6-80 guaranteed battery, steel battery box, tail light, dash light, switch ammeter and all necessary wiring for complete up-to-date plant. Write for catalog.

\$50.00

**DEALERS
Write for Discount**



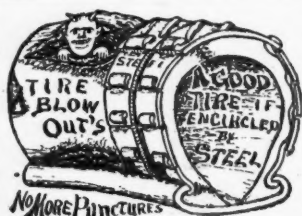
**The
Xcel-O-Lyte
Company**
(Formerly BEST-LITE CO.)
NEWTON IOWA

See the
LEECE-NEVILLE
Starting & Lighting System

At the New York Show
Space D-24 A

Also shown on Haynes and Thomas cars
Write us for full information

THE LEECE-NEVILLE COMPANY
1059 Power Avenue CLEVELAND, O.
(42)



**Steel
Protectors**

Each section
2" wide 1/8"
thick. They hook to rim. As flexible as
ever. Anti-skid, can't blow out or rim cut.

**HOW CAN THE RUBBER WEAR OFF
IF IT IS COVERED WITH STEEL?**

Try 2 or 3 sections over any old blowout

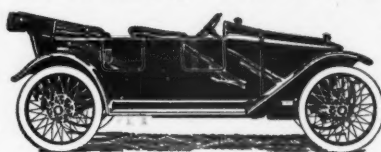
Special prices to the first in new territory

Kimball Tire Case Co. 173 Bdwy. Council Bluffs, Ia.



Tire covered
complete

BIGGEST VALUE Ever Offered



Unit power plant, select-
ive transmission, Dual
magneto, shaft drive
axle, V radiator, 30"x3"
wire wheels, demount-
able rims, cantilever
springs, 48" tread, 105"
wheelbase, fully
equipped with top,
windshield, speedometer,
horn, extra wheel.

CAR-NATION CAR—20 H. P.
SPECIAL PRICES

Touring Car, \$580 value for.....\$340
Roadster, \$555 value for.....\$320

ORDER TODAY! ONLY A LIMITED NUMBER

AUTO PARTS COMPANY, Dept. O
737-739 West Jackson Boulevard CHICAGO, ILL.

Write
to-day for our
Territorial Agreement
on the

New \$1000

**Inter-State
"FOUR"**

The one popular priced car with
the greatest selling arguments
in the country.

Inter-State Motor Co.
802 W. Willard St.
MUNCIE, IND.

Sparton Warning Signals

for the low—the medium
and the high priced cars,
motor driven & hand operated.

PRICE from \$4.25 to \$15.00

Write for DEALERS' Proposition

The Sparks-Withington Co., Jackson, Mich.



THE FORD LINE

Runabout \$440—Touring Car \$490—Town
Car \$690—and the two new Ford cars:
Coupelet \$750—Sedan \$975.

With full equipment f. o. b. Detroit

Ford Motor Company.

Detroit, Mich.

PENNSYLVANIA
Oilproof
VACUUM CUP TIRES

Making their
mark everywhere

Guaranteed for
4500 miles

**Pennsylvania
Rubber Company**
Jeannette, Pa.



TRADE MARK
REG. U.S. PAT. OFF.

HOLLEY
CARBURETOR

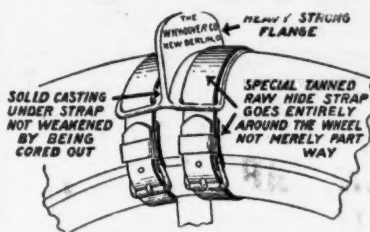
**NO MOVING PARTS
ONLY ONE ADJUSTMENT**

WRITE FOR
PARTICULARS

Holley Brothers Co.
Detroit Michigan



WITH THIS MUD HOOK



you can dig out of the deepest mud or sand and the Hook will stand the strain.

THE HOOVER MUD HOOK

is a practical and sturdy device, made right for the work.

Heavy cast flange—plenty of metal to give necessary strength. Special tanned rawhide straps, going entirely around the wheel. Shipping weight, packed for parcel post, 3 lbs.

Many times more effective than chains to get you out of a hole. Prices: No. 1, for 3 to 4½ in. tires, \$1.00; No. 2, for 5 to 6 in. tires, \$1.10.

Write for 1915 Catalogue of Auto Leather Necessities

The W. H. Hoover Company, New Berlin, Ohio

KisselKar 36 "Four"
\$1450



The All-Year Car

Biggest idea of the year in body design.

Every inch a Car **KISSELKAR** Every inch a Car

Two-Door Body and Detachable Sedan Top afford the KisselKar owner all-weather service at but \$350 additional.

Ask for Details

KISSEL MOTOR CAR CO.
121 Kissel Ave. Hartford, Wis.

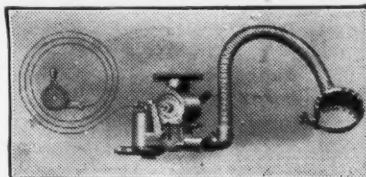


Detachable Sedan Top, \$350 addi.

MASTER Carbureters

COPYRIGHTED

Every Dealer Can Sell the MASTER Now
Every Engine Can Have a MASTER Now



Not Ordinary Results
Phenomenal Results
More Lugging Power
More Miles per Gallon

The men who sell the MASTER sell results.

WRITE FOR BOOKLET

MASTER CARBURETOR CORPORATION

944 Woodward Ave.

Detroit, Michigan

Pacific Coast States: Master Carburetor Co., Inc., Los Angeles

NEW VULCAN "35"

"A Quality Car at a Quantity Price"

PRICES

TOURING CARS

ROADSTERS

5 PASSENGER

\$975

2 PASSENGER

Completely and fully equipped, with Westinghouse Starting, Lighting and Ignition System

F. O. B.
PAINESVILLE
OHIO

Manufactured by VULCAN CAR Co., Painesville, O.

Searchlight Gas

the most economical and dependable lighting system on the market.

Full details mailed to you on request.

THE SEARCHLIGHT CO.

GENERAL OFFICE, 1016 KARPEN BUILDING
CHICAGO, ILL.

FEDDERS RADIATORS



Fedders Manufacturing Co., Inc.

Buffalo - - - N. Y.

Dayton Airless Tires

For War—Recommended by American and Foreign Experts for motor car service.

For Peace—Used all over the United States on cars of all sizes. Comfort and absolute freedom from tire annoyances.

For Fords—We are obliged to double our production on these sizes every three months. Enough said.

For All Cars—A tire that is absolutely blow-out proof and puncture-proof.

For You—Write today for full details and name of nearest dealer.

THE DAYTON RUBBER MFG. COMPANY
DAYTON, OHIO

MARMON

"The Easiest Riding Car In The World"

"41"

\$3250

152" Wheelbase

"48"

\$5000

145" Wheelbase

Nordyke & Marmon Company
Indianapolis (Established 1851) Indiana
"Over Sixty Years of Successful Manufacturing"

Announcement

On and after December 1,
1914, our new schedule be-
comes operative, as follows:

Brown Impulse Tire Pump.....\$12.00

Including C. I. hose, gauge and quick attachment feature

Brown Junior Tire Pump.....\$5.50

Including 10 ft. hose, "T" and Gauge, etc.

THE BROWN CO.
SYRACUSE, N. Y.

THE POWERFUL, SILENT SPHINX

\$695

A REAL AUTOMOBILE

The lightest, strongest, most serviceable and economical
machine of its kind ever built.

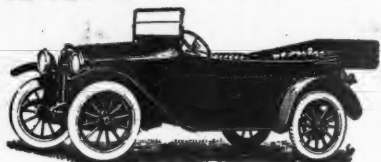
112 inch wheel base. Electrically started and lighted.

Sphinx Motor Car Company, York, Pa.

The **Detroit**—\$985

With Westinghouse
Starting and
Lighting System

FIRST
Pure
European
Streamline
in This
Country



FIRST
Long-
Stroke
Ball-
Bearing
Motor

Full Floating Rear Axle, Platform Rear
Spring Suspension, All Recording Instruments in
One Unit, Red Electric Flash Oil Gauge, Carburetor Above
Frame, 112 Inch Wheel Base, Left Hand Drive, Center One-Lever
Control, Multiple Disc Clutch in Oil, Less than 2300 Pounds, 32 H. P.

Briggs-Detroit Co., 455 Holbrook Ave., Detroit, Mich.

Write for Catalog and Proposition

KINGSTON IGNITION DEVICES

High and low tension magnetos, make-and-
break coils, dash coils, box coils, motorcycle
coils, switches, spark plugs and other igni-
tion specialties. Guaranteed satisfaction

WRITE FOR CATALOG

KOKOMO ELECTRIC COMPANY, Kokomo, Ind.

Firestone Accessories



Easy to sell because of their repu-
tation. Profitable because of their
quality—the kind that repeats.

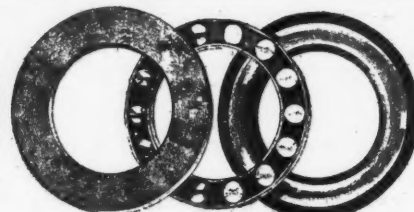
Everything the motorist needs for
simple, quick, reliable help.

Catalog shows complete line. Write.

Firestone Tire & Rubber Co.
AKRON, OHIO
Branches and Dealers Everywhere



RADIAL RETAINERS



COMPLETE THRUST BEARING

The Star Ball Retainer Co.
Lancaster, Pa., U. S. A.

Manufacturers of Radial Ball Retainers, Thrust
Ball Retainers, Complete Thrust Bearings



Hyatt Quiet Bearings

HYATT SERVICE STATIONS

Atlanta, Ga.	Detroit, Mich.
Boston, Mass.	Los Angeles, Cal.
Chicago, Ill.	New York, (Harrison, N. J.)

SERVICE AGENTS

High Wycombe,	England
Broom & Wade	
Minneapolis,	Minn.
Pence Automobile Co.	

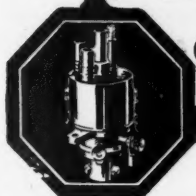
HYATT ROLLER BEARING CO.
DETROIT, CHICAGO
NEWARK, N. J.

CONNECTICUT AUTOMATIC IGNITION

Gives its hottest spark for starting and at low speeds.
Gives a better spark than the magneto at highest attainable speeds.

Investigate—Catalogue on Request

CONNECTICUT TELEPHONE & ELECTRIC CO., Inc.
MERIDEN, CONN.



METZ "Twenty-Two" Roadster

WINNER OF THE
GLIDDEN TOUR



\$495

Equipped Complete

Fore-door body, extra thick tufted upholstery, plate glass rain-vision wind shield, left-hand drive with center control, 4-cylinder, 22½ H. P. water-cooled motor, Bosch magneto, Prest-O-Lite tank, extension top, full elliptic springs, artillery wheels, best quality Goodrich clincher tires, 5 lamps, horn, pump, jack, tools. Speed, 50 miles per hour. Best 'em all at climbing hills. Secure EXCLUSIVE SALE in your territory. Write for terms and Catalog "K."

METZ COMPANY

WALTHAM, MASS, U. S. A.

WINTON SIX

To Meet Your Taste

The rare beauty of this car challenges admiration. Best of all, we give *your personal* car a special individuality to meet your own good taste and to distinguish *your* car from every other owner's car. Write for 1915 catalog; now ready. Ask us about the exclusive feature of individuality for *your own* car.

THE WINTON MOTOR CAR COMPANY
424 Berea Road, Cleveland, Ohio

World's First Maker of Sixes Exclusively

**Corcoran
Lamps**

GAS, OIL, AND ELECTRIC

CORCORAN LAMP CO.
CINCINNATI, O.

SHALER \$3.50

Safety Vul-Kit

Vulcanizer

Save Tires—Saves Repair Bills

Repairs punctures, blow-outs and cuts in casings or tubes, perfectly—makes repair strongest part of tire. No watching, no regulating, automatic in operation. Impossible to undercure or overcure. Has no open flame—no danger if accidentally upset. Anybody can use it. Furnished complete at \$3.50 with all repair material. Investigate.

Send for Book "Care and Repair of Tires"—its free.

C. A. SHALER CO. 250 Fourth St. Waupun, Wis.



IT'S GETTING COLD

but your engine will start as quickly as in Summer and the cylinders will fire as regularly if equipped with

Red Head
REG. U. S. PAT. OFF.

1915 PRIMING PLUGS

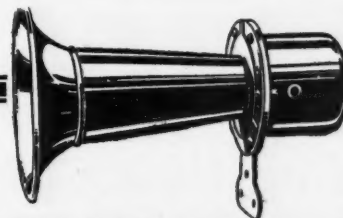
Masters the motor at any temperature

All Sizes \$1.25 Porcelain or Mica

FORD DEALERS: Write for new price

EMIL GROSSMAN MFG. CO. Inc.

Bush Terminal Model Factory No. 20, Brooklyn, N. Y. C.
Detroit—708 Ford Building.



Lowest Priced Electric Horn Obtainable

REXO II
\$3.85—Ready to Attach

Guaranteed for the Life of Your Car

THE GARFORD MFG. CO., 2503 Olive Street Elyria, Ohio, U. S. A.

The **AERMORE**
Exhaust Horn



The ideal auto horn. It clears the road every time with a musical signal that does not shatter the nerves. Four distinct notes are produced at once, blending in a perfect harmony.

No Up-Keep Expense

Consider that there are no batteries to run down, no wires or delicate mechanism to get out of order, and that your first cost is the last. Send for catalog.

DEALERS—Our prices are low. A small stock does not tie up much money. Discounts are liberal.

THE FULTON COMPANY

724-726 National Avenue, Milwaukee, Wisconsin



BRAENDER

Tires & Tubes

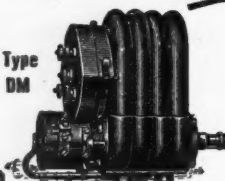
Service and Satisfaction Trade Mark

The *only* set of tires to complete the entire 500-mile race at Indianapolis, May 30, 1913. Consider that 88 Tires of other makes were changed in this race.


Our "Victory Folder" explains other races. *Established Agents Solicited*

BRAENDER RUBBER & TIRE CO.
Main Office & Factory, RUTHERFORD, N. J.
New York, 250 West 54th Street

Bulldog Non-Skid



HEINZE



The performance of HEINZE IGNITION APPARATUS for the past ten years justifies our claim that our product is superior in both points of construction and efficiency.

HEINZE ELECTRIC COMPANY

SALES OFFICES—DETROIT, MICHIGAN
FACTORY—LOWELL, MASS.

Service Stations—New York, Detroit, Chicago, Kansas City



STROMBERG

CARBURETOR

"The Accepted Standard"

The New Stromberg Carburetors make records for Economy, Power, Acceleration and Smoothness of Running.

Write for Information

Send us make and model of your car and we'll tell you which new model Stromberg is best adapted for it.

STROMBERG MOTOR DEVICES CO., Chicago, Ill.

PAIGE

Model "36" \$1195.00

A car whose design and construction is so far ahead of others at its price that it is in a class all its own.


Gray and Davis Electric starting and lighting equipment, silent chain cam shaft drive, four inch by five inch motor, cork insert multiple disc clutch, 116 inch wheel base, left side drive, center control, and equipment complete to the last detail.

Model "25" \$925.00
Including Electric Starting and Lighting System

This model has made the Paige reputation. Such a sturdy, powerful, comfortable car has never been offered the public at anywhere near its price. \$925.00 with complete equipment.

Splendid Agency Proposition

Paige-Detroit Motor Car Co., Detroit, Mich.







BOSTONSTARTER

For FORD CARS

¶ Fully Guaranteed. ¶ Does the work. ¶ Cost—a fraction of electric starting cost. ¶ No harm to car; does not interfere with cranking in usual manner. ¶ Releases in case of backfire. ¶ Retards spark automatically before starting. ¶ Time tried success—no experiment. ¶ Be sure you get the BOSTON STARTER. ¶ Ask the Ford dealer or your dealer or write.

Boston Starter, Boston Mass.

TRADE MARK

Raybestos

REG. U.S. PAT. OFF.

THE PRODUCT OF BRAKE SPECIALISTS

USED FOR
BRAKE LINING - CLUTCH FACING


Manufactured by
THE ROYAL EQUIPMENT COMPANY
Bridgeport Conn.

HOUK

Detachable WIRE WHEELS

"The wheel that makes any car modern"

GEORGE W. HOUK COMPANY
1702 Elmwood Avenue, Buffalo, N. Y.



SALISBURY

AXLES WHEELS PROPELLERS

Salisbury Wheel & Mfg. Co.
JAMESTOWN, N. Y.




The Atwater Kent Ignition System

Adopted by 60 Manufacturers in the Past Year

4934 STENTON AVENUE
PHILADELPHIA, PA.

SINGLE UNIT



REGISTERED TRADE MARK

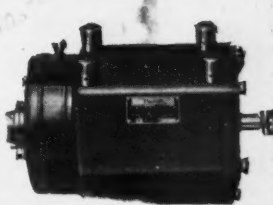
Electric Starting and Lighting System

Famous on the Franklin

Weights less than two-unit systems. Naturally more efficient and less complicated than either one of two units.

A Combination Motor Generator

Write for Particulars
DYNETO ELECTRIC CO., Syracuse, N.Y.
Send Us Your Electrical Problems



B.F. Grammm's Trucks

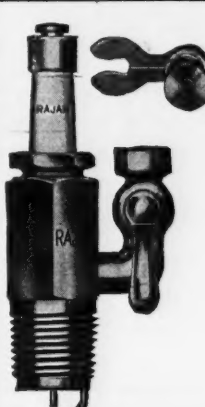


Appeal to the man who has had experience in the use of motor trucks.

To him their quality points, the individual clutch transmission, guaranteed springs, self-starter, etc., mean a definite saving in operating costs.

The full line, 1 to 6 tons, is described with all its features in our complete catalog, which will be sent you on request.

The Gramm-Bernstein Company
Dept. 9 Lima, Ohio, U. S. A.



RAJAH PRIMING PLUG

Not an untried experiment but a PLUG that will give universal satisfaction. Made by a manufacturer whose product has been recognized as the standard for over ten years. Take advantage of this experience. Let us send you a catalog and give you further information. Order from your dealer or remit direct to us.

\$1.50 Postpaid with Terminal

RAJAH AUTO-SUPPLY COMPANY
Bloomfield, N. J.
John Millen & Son, Limited
Montreal, Toronto, Vancouver, Winnipeg




Get This Catalog

It contains descriptions of all the famous Campbell Motor Car Accessories; Seat Covers, Percama, Johnson Model "D" carburetor, Straps, Boots, etc., etc.

Territory open for reliable established dealers

The Perkins Campbell Co.
624 Broadway CINCINNATI, O.



Prest-O-Lite

for Oxy-Acetylene Welding & Cutting

A big source of profit to garages. Makes enormous savings in repair work. Write for details of our \$60 welding apparatus, and our Service Plan on Cylinders and Acetylene.

\$60

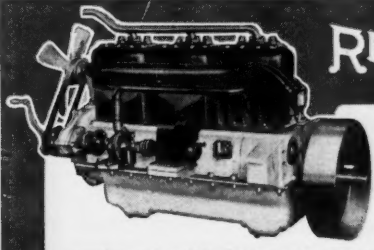
The Prest-O-Lite Company 233 Speedway Indianapolis, Ind.



ZENITH CARBURETOR

For seven years the unchanging standard of quality motor vehicles

Detroit U.S.A.



THE RUTEMBER MOTOR

Low First Cost is not the determining consideration with most of those who buy cars equipped with Rutember Motors. They can afford to buy the best, regardless of price. But investigation and experience have proved that no car is better than the cars that carry the Rutember Motor.

THE RUTEMBER MOTOR CO.
MARION, INDIANA

OSGOOD AUTOLITE DEFLECTORS

have experienced a tremendous demand. More dealers are desired—also local managers in every city and county to extend distribution. Attractive proposition. Hurry! Ask for particulars.

This glareless glass fits any automobile headlight. Deflects rays without diminishing light. No glare. Avoids accidents. Equally good for city or country driving. Nothing else like it.

Endorsed by Chicago and other municipal authorities where glaring headlights are condemned. Retail \$5 the pair. Money-back guarantee. If your dealer cannot supply you, order direct.

OSGOOD AUTOLITE DEFLECTOR COMPANY
Dept. 12, 404 First National Bank Building CHICAGO



Lexington

CRITERION OF ITS CLASS

Thoroughbred Six—\$1875 Famous Four—\$1375
Six Supreme—\$2575

All equipped with the Moore Multiple Exhaust

Write for Details and Co-operative
Dealer Proposition

The Lexington-Howard Co. Eighteenth Street West
Connersville, Ind., U. S. A.

You can take a thousand miles of service out of a set of tires by driving them insufficiently inflated over ten miles of road.

Use the New Positive Lock Stop

TWITCHELL AIR GAUGE

and save your tires



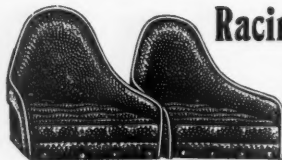
"TIRE INSURANCE FOR \$1.00"

Simple, Accurate, Durable and Easily Read

FOR SALE BY JOBBERS, DEALERS, GARAGES, OR

The Twitchell Gauge Co.

1201 Michigan Avenue CHICAGO, ILLINOIS



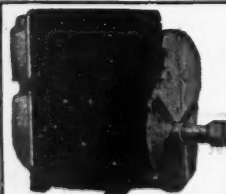
Racing Type ROADSTER SEATS

Adapted for any car; will make an old car up to date. Made of heavy gauge leaded steel, rolled edges, durable and comfortable, 16" wide, 17" deep, 21" high. Upholstered in black muleskin, pair...\$23 DEPT. O.

AUTO PARTS COMPANY

737-739 West Jackson Blvd.

CHICAGO, ILL.



FOR FORD CARS FISHER ELECTRIC LIGHTING and STARTING SYSTEM

Motor and generator combined in one compact, self-contained unit, although acting independent of one another. 12-volt, 8-wire system, 6-volt lamps. Noiseless. Attached without machine work. Write
Fisher Electrical Works, Detroit, Mich.

TRADE MARK
NON-FLUID OIL
REGISTERED
PATENT OFFICE



That NON-FLUID OIL best meets the exacting requirements for a WINTER (as well as Summer) automobile lubricant has been proved by thousands of leading motorists and automobile manufacturers during the last 19 years. Made only from the highest grade mineral oils, NON-FLUID OIL is not affected by temperature, but retains its "body" in any climate and lubricates perfectly to the last small particle. Lasts 3 to 4 times longer than LIQUID oils, and greases,—hence, is MOST ECONOMICAL.

"K. No. 00 Special" grade for sliding gear transmission
"K. No. 000" for differential, compression cups and all bearings
Sold by leading dealers everywhere. Look for the orange-colored can bearing sprocket-wheel trade-mark shown above

New York and New Jersey Lubricant Co.
165 Broadway, New York 1430 Michigan Ave., Chicago

"Bridgeport"
TRADE MARK
U.S.A. U.S.A.

TIRE PUMPS

Are easy to use and easy to sell. They are durable and efficient and are widely advertised. The cylinders are of seamless brass tubing which cannot rust. The "Stapley," the "Aeolus," "Windjammer," etc., give lasting satisfaction. Carry them in stock.

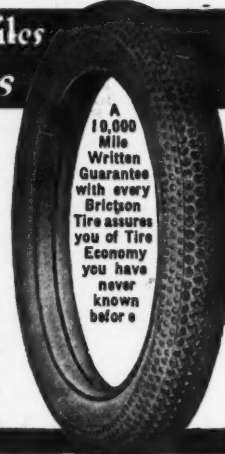
Bridgeport Brass Company
P. O. Box A Bridgeport, Conn.

Guaranteed for 10,000 Miles Bricton Pneumatic Tires

We now sell Bricton Pneumatic Tires on a specific guarantee of 10,000 miles service. Bricton Pneumatic Tires are Puncture-proof, Blowout-proof, Skid-proof, Rut-proof, Rim cut-proof, Oil-proof and Gasoline-proof. A tire with wonderful resiliency and easy riding qualities.

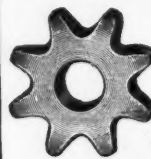
FREE TRIAL OFFER—To remove any possible doubt concerning the merits of Bricton Tires and to back up our statements fully, we have a FREE TRIAL offer at our own risk. The only tire made that offers a FREE TRIAL—you can't go wrong. You risk nothing. We take all the risk. Be sure and ask for our FREE TRIAL plan when you write for particulars.

Have Your present Tires Rebuilt the BRICTON WAY—If you are not in need of new tires and the fabric in your tires is still good, we can rebuild them the Bricton Way, give you thousands of miles additional service and make them Puncture-proof, Blowout-proof, Skid-proof, Rut-proof, Rim cut-proof, Oil-proof and Gasoline-proof.



A 10,000 Mile Written Guarantee with every Bricton Tire assures you of Tire Economy you have never known before

SPROCKETS CHAINS AND DIFFERENTIAL IN STOCK OR ORDER SEND FOR NEW CATALOG



Cullman Wheel Co., 1341 Altgeld St. Chicago

SE-MENT-OL

will dissolve in the water and stop that leak in the radiator or water jacket

ASK YOUR DEALER OR WRITE DIRECT

MANUFACTURED ONLY BY
The Northwestern Chemical Co., Marietta, Ohio

The Clearing House of the Motor Car Industry

*For Second Hand Cars, Surplus Parts, Accessories, Tires,
Machinery & all other Special Announcements of a Similar Character.*

ADVERTISING RATES 1/4 inch—One time, \$2.40. 1 inch—One time, \$4.50. 1 1/2 inches—One time, \$6.75. 2 inches—One time, \$8.75.
Rates for other spaces and longer terms furnished upon request.

CARS FOR SALE

FOR QUICK SALE

1913 7-passenger Stoddard-Dayton Touring Car, just overhauled, entire car in tip top condition. Tires all fine. Electric lights and horn. Painted green with red hair line stripes. An ideal car for lively purpose. Will sacrifice at \$850.

PALMER SALES COMPANY
Grand Rapids, Mich.

FOR SALE AT BARGAIN PRICES

Three 1 1/2 ton White passenger trucks (capacity 25 people). With special bodies, extra equipment and pay boxes, etc.; cost retail about \$4,500. Practically new, run irregularly for six months. If you could see them you would buy them. Address

GUY C. STOLTZ
Care Marion Motor Car Co., Marion, Ohio

GET OUR LATEST BULLETIN OF USED CARS

You will surely find one to fit your requirements. You can get from us good, serviceable machines of various makes for \$400 and up. Let our reputation be your guide.

PACKARD MOTOR CO. OF CHICAGO
2367 Michigan Ave., Chicago, Ill.

GUARANTEED AUTOMOBILES—ANY MAKE
at your price. Write us your wants. Engines, Axles, Bodies—anything at prices that will surprise you. Satisfaction or money back.

PROGRESS BROKERAGE CO.
527 Grant Street Buffalo, N. Y.

Marion, 5-passenger, fully equipped, torpedo body, electric lighted and up-to-date in every way. Will sacrifice if taken at once.

CONDON, 2635 Wabash Ave., Chicago, Ill.
Calumet 5311

Matheson

Cars and Repair Parts

FRANK F. MATHESON, Wilkes-Barre, Pa.

Mitchells Rebuilt, Guaranteed
These cars are fully equipped. Call or write for further particulars.
MITCHELL AUTOMOBILE CO.
2334-36-38 Michigan Ave. Chicago, Ill.

ONE 20 H. P. WHITE STEAMER

One 40 H. P. White Steamer; one 30 H. P. White gas car. Address

Box E 191, care Motor Age

Special built speedsters; speed very fast, price \$1,500; also will consider your old car as part payment. Write for full information to

G. J. G. MOTOR CAR COMPANY
White Plains, N. Y.

CARS WANTED

WANTED—To trade new Gasoline Engines, 1 to 12 H. P., for 1914 or 1915 Runabout. Catalog mailed to interested parties.

THE SCOTT & EWING CO., Bluffton, Ohio
Mfg. High Class Gasoline Engines

TEXAS FARM LAND

For a Serviceable Auto

Will take a serviceable auto as part pay on a 160-acre farm at \$15.00 per acre. Farm is level and fenced, on a good road 5 miles from a thriving town; best of soil and big crops on each side.

A Big Bargain at the Price
A. L. STONE Texline, Texas

HELP WANTED

WANTED—A Mechanic in your locality, one familiar with soldering. Good job for right man.

INTERNATIONAL METAL CO.
1719 W. Van Buren St. Chicago, Ill.

MACHINERY

50 LINCOLN MILLING MACHINES
\$50.00 Each
Send for photo and description

LUCAS & SON, 5 Fox St., Bridgeport, Conn.

MAGNETOS

MAGNETOS REPAIRED

Bought, sold and exchanged. Bosch, Elsemann, Splittdorf, Mea. Expert repair work guaranteed.

MAGNETO SALES CO.
1777 Broadway New York City

MAGNETOS REPAIRED BY A MAGNETO SPECIALIST. Expert on Bosch, Elsemann, Remy. Magnetos bought, sold, installed and repaired at short notice. Agent for N. Y. Coll Co.
GENERAL MAGNETO REPAIR CO.
256 Halsey St. Newark, N. J.

We are the oldest and largest repair shop in the country. Our experience and knowledge is at your service. Let us know your troubles and get our prices on repairs; also on new and used magnetos.

PELLET'S MAGNETO EXCHANGE

1606 Michigan Ave. Chicago, Illinois

MAILING LISTS

Ask for Special Price List

Auto Owners, Ford Owners, Ford Dealers, all other dealers, Garages, Repairs, Supplies, Manufacturers, Jobbers, anything pertaining to the Auto Trade.

Auto List Dept. A. F. Williams, Mgr.
166 West Adams Street CHICAGO
Phone Franklin 1182

MAILING LISTS AND STATISTICS. Owners or dealers; any state, county, city; weekly and monthly supplements at lowest prices. Special lists of electric, trucks, Fords, Studebaker, Overland, etc. **MOTOR LIST CO. OF AMERICA, 1107 Locust St., Des Moines, Iowa.**

MOTORIST'S BOOKS

A. L. DYKE'S AUTO INSTRUCTION. A new idea of instructing you with working models to care for and repair automobiles. Simplified instruction on self-starters and lighting just added. Send for free 32-page illustrated booklet. **A. L. Dyke, Box 16, Roe Bldg., St. Louis, Mo.**

Parts and Accessory Manufacturers

Have you carefully investigated the motorcycle field? At least one hundred and ten thousand machines, averaging two hundred dollars each, will be produced in 1915. The most widely circulated journal and the best medium in the field is

MOTORCYCLE ILLUSTRATED

51 Chambers St. New York City

"THE MODERN MOTOR CAR"
Just off the press—512 pages covering all phases of the Motor Car. 170 pages on Electric Starting and Lighting. Send for sample pages.

LAIRD & LEE, Inc.
1732 Michigan Avenue Chicago, Ill.

THE PRACTICAL HAND BOOK

of Gas, Oil and Steam Engines.
Send for complete circular.
CHARLES C. THOMPSON CO.
1130 S. Wabash Avenue, Chicago, Ill.

THIS BOOK ANSWERS 1001 MOTOR TROUBLES

Contains Motor Laws of Every State Valuable Lubricating and Oil Charts. It is called the Motorists' First Aid Hand Book. It fits in your coat pocket. Is handy and compact.

Price Only 75c
Sent postpaid Stamps accepted
AUTO MERCURY PUBLISHING CO.
Candler Bldg., 220 W. 42nd St., New York

MOTORIST'S CLOTHING

FUR LINED OVERCOATS

Limited quantity Manufacturers' samples. Black broadcloth outside, lined throughout with Mink dyed marmot. A beautiful Fur, like Mink. Large Persian lamb collar. Making a handsome coat suitable for Dress wear or driving. All sizes.

\$27.50

Would retail for \$60.
SENT ON APPROVAL
You take no risk. Examine and try on before paying. Write today, stating size, enclosing 50c. for express charges only, and coat will be sent at once. Few large size Fur robes, \$15 each, worth \$30.
E. HART, Dept. E, 3405 Broadway, New York

Rubber Plush Cloth	ROBES	Spring-Belt Fur Steamer
Fur Lined Quilted Lined	—And— COATS	Plush Lined Fur

—WHOLESALE ONLY—

CHICAGO AUTO ROBE SUPPLY CO.
14 So. Market St., Chicago, Ill.

PARTS AND ACCESSORIES FOR SALE

A. A. A. A. ATTENTION A. A. A. A.
Selling out at one-half price the entire stock of the Service Storage Battery Co., 6-60 to 6-150 lighting, igniting and starting batteries.
SIMPLEX BATTERY CO.
120 E. 33rd Blvd. Chicago, Ill.

AAA SPEEDOMETERS AAA
Send for special price list of Speedometer Parts.
GENERAL SPEEDOMETER REPAIR CO.,
53 W. 63rd St., New York City

The Clearing House—continued.

AGENTS AND DEALERS

We announce a reduction of from \$20.00 to \$14.00 on our Spare Demountable Wheels for the Ford. We have some good territory left. Why not handle an original line? Carry extra wheel with tire on ready and interchangeable with any of present wheels. Can install outfit at home, then change wheels in less than two minutes. Write for catalogue. Legitimate dealers, get our agency for Spare Wheels, Spring Radius Rods, Fan Belts, Radiators, Cradles, etc. "ANGIER'S," Dept. B, Streator, Ill., U. S. A.

ALL PARTS IN STOCK AT DISCOUNT

Atlas, Bergdoll, Chalmers, Ewing, Alco, Packard, Hudson, Herreshoff, etc. Brown-Lipe Gear Parts, Continental Motor Parts, STA-RITE Rings, \$1.00 each. Regular Piston Rings, 30c each.

JOS. C. GOREY & CO.

354 W. 50th St. New York City

ALLEN'S SPECIAL BARGAIN BULLETIN

Just off the press. Write for it at once.

Fred Allen Auto Supply Co.

1610 Michigan Ave. Chicago, Ill.

ALL SEASON'S RECORDS MADE WITH Schebler equipment. Why not get a Schebler model R for your car? Our exchange proposition makes it easy.

J. C. NICHOLS, Direct Factory Distributor
1673 Broadway New York

AMERICAN UNDERSLUNG PARTS AND REPAIRS

Exclusive Sales Representatives for Manufacturers who supplied Motors, Axles, Wheels, Transmissions, Steering Columns, Control Levers, etc., etc., to the

American Motors Company

Write for prices on parts needed in connection with American cars.

V. A. LONGAKER COMPANY

INDIANAPOLIS, IND.

American Underslung and Marion

Motor Car Parts and Service

CHARLES E. RIESS & CO., Inc.

1690 Broadway, New York

ATLAS AND ELMORE PARTS

We have purchased the jigs, tools, drawings and can supply immediately parts at less than cost to manufacture. Order now—20% off.

AUTO PARTS & REPAIR CO., Springfield, Mass.

ATTENTION, HENRY OWNERS

We are prepared to fill orders promptly for repairs for Henry cars.

MUSKEGON AUTOMOBILE CO.

Muskegon, Mich.

AUTO DEALERS AND GARAGES

We have special offer to make on 10,000 spark plugs. Get our prices on anything required.

WESTCHESTER ACCESSORIES CO.

1777 Broadway New York City

Auto Lamps With the Enamel Looking Old and Chipped

Can be made to look like new with one coat of Peerless Lamp Enamel. Made to dry with gloss or dull finish. Ask your dealer.

THE COLUMBUS VARNISH COMPANY

Columbus, Ohio

AUTOMOBILE PARTS

MICHIGAN, MORA AND DRAGON PARTS IN STOCK

We maintain a complete stock of parts for the above cars.

PHILADELPHIA MACHINE WKS.

67 Laurel Street, Philadelphia, Pa.

Automobile Seats and Cushions

of leather are made to look like new with one coat of Peerless Cushion Dressing, that does not crack, wash or rub off. Ask your dealer.

THE COLUMBUS VARNISH COMPANY

Columbus, Ohio

AUTOMOBILES, BODIES AND PARTS

New and second hand for many makes of cars for sale cheap. Write us when in need of parts.

GEO. SCHMITZ & BROS.

666 Genesee St. Buffalo, N. Y.

AUTO SALVAGE COMPANY

1436 Wabash Ave., Chicago, Ill.

2-Cyl. Buick parts. D4 Bosch, \$35.00. 60 H. P. Thomas Engine, with Bosch Magneto, \$100.00. D6 Bosch Magneto, \$45.00. Type 10 Buick parts, 2 cyl. Maxwell power plant, \$70.00. Pope-Toledo parts for sale. 25 H. P. Oswald eng. with mag., \$90. 28 H. P. Regal motor, \$100; 9K Stoddard-Dayton motor, \$150. 45 H. P. Stoddard-Dayton, sel. trans., \$45.00. 50 H. P. Royal Tourist motor, \$75.00.

AUTO TOPS BUILT and REPAIRED

Seat covers and body building, remodeling and trimming. Write for prices.

BITLEY TOP & BODY CO.

1342-4 W. Jackson Blvd. Chicago, Ill.

AUTO USERS

Save your blankets, coats, etc., from thieves. Our Auto Lock fastens them securely to the robe rail. Saves dollars.

VALIER SPECIALTY CO.

923 South 53th St. Philadelphia, Pa.

BATTERY BARGAINS

6-80 Batteries, \$6.00 each (only 12 left) We carry all sizes. Write for prices.

THE AMPVO BATTERY CO.

3031 Michigan Ave. Chicago, Ill.

BALL BEARINGS REGROUND

We guarantee them as

GOOD AS NEW

All sizes and makes in stock ready for immediate delivery—At prices that will interest you.

AILBERG BEARING CO.

2640 Michigan Ave., Chicago. 1790 Broadway, New York. 805 Woodward Ave., Detroit. 93 Massachusetts Ave., Boston. 1841 Euclid Ave., Cleveland, Ohio. 325 W. Pico St., Los Angeles, Cal.

CoCoa and Carpet Mats, Hand Made Seat Covers, Auto Tops Built and Repaired.

AUTO CAPE TOP CO.

2334 Michigan Ave. Chicago, Ill.

CROXTON REPAIR PARTS

Always on Hand

CROXTON MOTOR CO.

515 Jackson Blvd. Chicago, Ill.

CUT PRICES

Send for our illustrated cut price auto supply catalogue.

Liberty Tire & Supply Co.

98 Chambers St. New York, N. Y.

DEALERS WANTED

To handle Parradee's Perfect Tire Preserve, the best tire coating made. Guaranteed to give satisfaction or money refunded; 60c per pint; will coat 12 to 20 tires. Write for discount.

EDWARD PARRADEE

7457 Coles Ave.

Chicago, Ill.

DESIGN FOR LIGHT CAR

The designer of three successful cars will sell a limited number of complete sets of prints for a four cylinder light car. Shaft drive and handsome and up-to-date design, composed of standard units easily obtained and reasonable prices. Complete set of prints, list of parts and where obtained for \$5.00. Money returned if not satisfactory. Send for information and sketch of car.

Fenton Engineering Co., Fenton, Mich.

CLOSING OUT

Bodies, Frames, Etc.

at 20 Cents on the Dollar

NOT UPHOLSTERED

American fore door 4-passenger 35x103"	\$ 10.00
Croxtion 7-passenger 35x100"	10.00
Henderson 4-passenger 33x92"	10.00
Midland 5-passenger 35x100"	12.00

UPHOLSTERED BODIES

American	75.00
Henderson	65.00
Midland 5-passenger	90.00
Croxtion 7-passenger less auxiliary seats	50.00
Model 35 or 40 roadster body	55.00
American Scout body	55.00
Cover panel delivery body, will fit Ford	35.00

TOPS

American, Rambler and Midland 5 and 7-passenger used tops, each	15.00
New Chalmers mohair tops with curtains	25.00
Windshields, 20x41", nickel, one piece	9.00
Windshields, 20x41", black, folding	6.00

PRESSED STEEL FRAMES

4 cyl. Midland, 141" long, kick up rear	6.00
1913 Michigan, 146" long, kick up rear	9.00
Demot, 28x110" straight with hangers	3.00
Sterling, 32x150", 17" sub frame, 4" channel	8.50
Croxtion, 32x151½", no sub frame, 4½" channel	8.50
Little Motor Co., 34x136", 17" sub frame	8.50

REAR AND FRONT AXLES

Weston-Mott full floating, suitable for 7-passenger, 56" or 60" tread complete, hubs, drums and caps	70.00
Lewis floating axle, 60" tread	80.00
A. O. Smith floating axle, 50" tread	75.00
Weston-Mott semi-floating axle for 3,000 lb. car	50.00
Lewis front I-beam axle, left hand drive, with hubs	20.00
Henderson, Weston-Mott I-beam axle, less hubs	10.00
Weston-Mott 60" I-beam with hubs	20.00
F-A-L I-beam axle with hubs, right hand steer	15.00
Demot 1½" square front axles, less hubs	2.00
Gray-Hawley mufflers, 6x20", 2" iron pipe, each	3.25
Oldberg mufflers, 6x15½", for 1½" pipe, each	2.00
I-beam connecting rods, 12" center, each	.75
4" and 4½" finished pistons, each	1.50
16" steering wheels, black spider	.90
3-ton truck steering gear, Ross	20.00
1-ton truck steering gear, Ross	12.00
Warner steering gear, right hand, 18" wheels	13.50
Fenders, 8" wide, with skirts, set 4	5.00
Fenders, 10" wide, with skirts, Midland, set 4	8.00

WHEELS, LESS HUBS

30x3 clincher rims (Ford), each	2.00
32x4 2" spokes, Q. D. rims, set 4	12.00
34x4 10 1½" spokes, Q. D. rims, set 4	8.00
34x4 12 1½" spokes, Q. D. rims, set 4	12.00
34x4 Firestone demountable, with rims, set 4	20.00

(Dozen other sizes at unheard of prices.)

MOTORS.

4 cyl. 4½x5½" Hershell Spillman motor	200.00
2 cyl. Oldsmobile motor, used	35.00
4 cyl. Cameron A. C., used	40.00

RADIATORS.

Jackson 24x24½", 4" deep, each	18.00
Mitchell model F	25.00
Oldsmobile 2 cyl. tube radiator, each	5.00
(We make radiators. Send pattern.)	
Overland roller bearings, 1½x4", with sleeve, each	1.00
Mogul Babbitt, very tough, per lb.	.25
Brown-Lipe differentials	10.00
Ring gears for starter to bolt on wheel, 16½" diameter	3.00
10" diameter, 2" wide brake bands, each	2.00
10½" brake drums, pressed steel, each	1.00

MAGNETOS.

6 cyl. U. & H. high tension	25.00
6 cyl. Briggs with coil	20.00
Eiseman type E. I. J. A4, automatic control R. H.	35.00
Eiseman type E. M. I. R4, dual with coil	40.00
4 cyl. K. & W. model H, high tension	30.00
4 cyl. model D Splitdorf with coil	30.00
Apelco lighting generator with cutout	30.00
Ward Leonard generator and controller	30.00
Wagner generator with amp meter	25.00

If you have not received our bulletin write today

DEPARTMENT O

AUTO PARTS COMPANY

737-39 W. Jackson Blvd.
CHICAGO

The Clearing House-continued.

Dirty Looking Cylinders and Rusty Engine Parts

should be coated with Peerless Cylinder Enamel. Solid Covering one coat. Made in Black and Gray. Ask your dealer.

THE COLUMBUS VARNISH COMPANY
Columbus, Ohio

DETACHABLE TONNEAU

Get Our Circular
"THREE FORDS IN ONE"

FORD DELIVERY BODIES
Racing Bodies and Bucket Seats
AUTO REMODELING CO.
1501-5 Michigan Ave. CHICAGO, ILL.

Do Your Fenders Look Like New?

With one coat over the metal or old enamel you can have a rich gloss enamel finish with Peerless Jet Black Fender Japan. Ask your dealer.

THE COLUMBUS VARNISH COMPANY
Columbus, Ohio

F. & H. WIRE WHEELS

Equipped with F. & H. Special Wire Wheel Rims. Adaptable to any car. Complete equipment for Ford cars.

THE F. & H. WIRE WHEEL CO.
Columbus, O.

Ford Combination Primer and Gas Saver

operates from the dash. Starts car on coldest days. Something new; worth \$5.00. Sent prepaid for only \$1.00. Agents wanted.

THE BROWNE SUPPLY COMPANY
Toledo, Ohio

FORD DELIVERY BODIES

12 styles, all sizes. Agents wanted everywhere.
COLUMBIA BUGGY CO.
21-23 Selden Ave. Detroit, Mich.

FORD OWNERS

Equip your cars with Seat Covers. Our direct to car-owners plan will save you money. Ten thousand satisfied customers last year.

GLOBE SEAT COVER CO.
Dept. M, RACINE, WIS.

Ford Owners and Repair Men

Differential gear 3-1 ratio, set.....\$15.00
Helical timing gears (noiseless), set..... 2.50
Repairs for Michigan, American, Midland, Deal, Elmore, F. A. L.
Cylinders and crank cases welded.

AUTO PARTS CO.
737-39 W. Jackson Blvd. Chicago

FORE DOORS

Racing Seats

You can get complete doors and panels from us at a reasonable price.

GET BUSY AND MODERNIZE YOUR CAR
Write for prices. We have all patterns. We also make racing seats, bodies, radiator covers, etc., etc.

CHICAGO AUTO BODY CO.
1627 Michigan Ave. Chicago, Ill.

FORE DOOR BODIES

1914 Models, five-passenger, fully upholstered; fit most any car. Cost \$350.00, our price, while they last, \$85.00. Write for full description.

THE M. & M. COMPANY
480-500 Prospect Ave., Cleveland, Ohio

FOR SALE

A small number of modern, well designed and constructed six, five and four-passenger touring bodies and comfortable roadsters painted and trimmed. Will change and guarantee to fit your car. Write us.

IRVIN ROBBINS & CO.

Industrial Building, Tenth and Canal
Indianapolis, Ind.

FOR SALE AT A BARGAIN

New 5x6 four-cylinder, governor-controlled engine, fully equipped, with carburetor, magneto. Will sell for much less than cost. **FRED HANSON**, 570 Prior Ave., St. Paul, Minn.

FOR SALE

Send for our monthly bargain list covering electric ammeters, generators, motors, lamps and parts. New and used stock of interest to all automobile and motor boat repairmen.

THE ESTERLINE COMPANY

223 E. South Street Indianapolis, Ind.

GUARANTEED RADIATORS

You need a strong, well built radiator these winter days.

HONEYCOMB RADIATORS

Ford T.....	\$25.00
Hupp.....	25.00
Buick 10, 24, 25, 34, 35, 36.....	27.50
Buick 16, 17, 19, 20, 26, 27, 28.....	37.50
Buick 21, 35, 39, 43.....	37.50

FIN AND TUBE RADIATORS

Ford T.....	\$20.00
Buick 10.....	25.00
Buick 24, 25, 34, 35, 36, B24, 25.....	22.50
Buick 16, 17, 35, 39.....	31.00
Buick 19, 27, 28, 43.....	28.00
Buick 21.....	30.00

Will ship on telegram same day C. O. D.

Detroit Radiator & Specialty Co.
963 Woodward Ave. Detroit, Mich.

GUARANTEED RADIATORS

Not always necessary to buy new radiators. New cores can be furnished for frozen or damaged radiators. We build the fin and tube type. Guaranteed copper fins and tube.

We also repair and furnish new cores for Maya radiators.

We build new cores for all makes and for all cars. Get our prices. You will save money.

Cores in stock for many standard radiators such as Hupps, Warrens, Herreshoffs, Buicks, E. M. F. 30, Studebaker, Hudson 20, Cadillacs and several others.

We can build and fit a new core in your radiator in two days—if in stock, in one day.

Write for bargain sheet of accessories.

HURON RADIATOR & LAMP CO.
253-255 Jefferson Ave., Detroit, Mich.
Terms cash with the order.

FOR SALE

Winter bodies, brougham and landau, \$250 to \$300. Pierce, Thomas, Studebaker and others.
PIERCE-ARROW SALES CO.
Buffalo, N. Y.

JOBBER AND GARAGES

Get our proposition on fibre gears for all makes of speedometers. We make anything you want from fibre.

OGDEN FIBRE GEAR & TIRE CO.
Columbus, Ind.

J. M. SHOCK ABSORBERS

25 per cent discount to reduce stock.
Write at once.

Address Box E 250, care Motor Age

Inventory Sale

Auto Parts and Accessories

10-in. Black and Nickel Gas Headlights.
11½-in. Black and Nickel Oil Sidelights.
9½-in. Black and Nickel Oil Tail Lamps.
Complete set, 5 lamps, for.....\$8.00

Mohair Touring Car Tops, with Collins adjustable side curtains, slip cover and windshield straps, made to fit Model 26 Chalmers cars, complete.....\$25.00

M. & M. Ford Shock Absorbers, ride easier and smoother than any other make, double spring enclosed. Price per set of four.....\$7.50

Weston-Mott Rear Axles.....\$50.00
I-Beam Front Axles..... 15.00
Splindorf Magneto, Model D-F and X, 4-cylinder..... 10.00
Simms Magnetos, 4-cyl., high tension, dual, with coil and lock switch 35.00

AUTO ENGINES

Owen—4 cyl., 50 H. P.....\$250.00
Howard—6 cyl., 50 H. P..... 400.00
Garford—4 cyl., 40 H. P..... 95.00
Model, 4 cyl., 25 H. P., with trans. 125.00
American-British, 4 cyl., 22 H. P., unit with transmission and clutch 135.00

Write for Full Information

THE M. & M. COMPANY

500 Prospect Ave., Cleveland, O.

Do You Want Our General Catalog?

It's Yours for the Asking

KEEP YOUR CAR LIKE NEW

all season, by using our famous

Keep Bright Duster

We guarantee this duster or we will refund your money. Polishes Auto Bodies, Fenders, Wind Shields, Lamps, etc.

50 Cents Prepaid

North American Sales Company

1123 13th Ave.

Moline, Ill.

LET US SEND A GOOD TOP

for your runabout for \$14 or touring car for \$27.
Send for Catalog.

Bison Trimming Co., Buffalo, N. Y.

The Clearing House—continued.

MAXWELL OWNERS AND REPAIRMEN

Why pay 20% advance for your repair-parts for the old models of MAXWELL cars? We can supply 90% of your wants at the old list price. Transmission gears and parts in stock for Cadillac, Case, Croxton, Dorris, Elmore, Moine, Moyer, Overland, Regal, Selden, Stoddard, Velle and 75 others at cut prices. Why pay more? Send for price list.

M. P. SUPPLY COMPANY
Atlanta, Georgia

MICHIGAN OWNERS!

We can ship immediately every part for every Michigan car, no matter what the model. We purchased and are successors to the Michigan Motor Car Co. and have sole access to all patterns and engineering data.

Every part guaranteed to be accurate. Shipments same day order is received.

MICHIGAN MOTOR CAR PARTS CO.
Successors to Michigan Motor Car Co.
KALAMAZOO, MICHIGAN

MORE SPEED FOR THE FORD

Special ratio Differential Gears for the Racy Type Ford.

2½—1 ratio.....\$15.00 Set
3 —1 ratio..... 15.00 Set

Absolutely interchangeable with the present gearing

DETROIT RADIATOR & SPECIALTY CO.
963 Woodward Ave Detroit, Mich.

ONE MAYO SQUARE TUBE RADIATOR with fan 40 H. P. and one A. Z. square tube radiator for 40 H. P., each having hood. One Rutenber 4¼x5" four cyl. motor with Stromberg carburetor and Remy magneto. Will sell with or without Hele-Shaw clutch.

HAL. R. WELLS Des Moines, Ia.

NEW 1914 FORD ROADSTER BODIES

Including cushion, top, curtains, slip cover and rear fenders; crated, \$35.00 F. O. B. Detroit. New 1914 Ford Touring Car Bodies, including equipment mentioned above, crated, \$85.00 F. O. B. Detroit.

JOHN C. NAGEL

425-33 Baker St. Detroit, Mich.

ONE GEMMER STEERING GEAR

with 18" wheel. One Warner three speed transmission with levers mounted on the top. One drive shaft with Spicer joints.

Address Box 256, care Motor Age

Paint Your Car Yourself

Save \$25 to \$75 by doing the work at home with the Arsenal system. Our big free booklet, "The Car Beautiful," tells how. Send for it today.

Arsenal Varnish Company

Auto Dept. Rock Island, Ill.

ONE TIMKEN FRONT AXLE

with roller bearing head and one Timken full floating rear axle with set of four 36x4 wheels to fit.

Address Box 257, care Motor Age

RADIATOR BARGAINS

Ford Model T Honeycomb.....\$17.00
Ford Model T Honeycomb, V-shaped..... 25.00
Buick 16 and 17..... 28.50
Buick 16..... 20.00
Hudson 20, 32 and 33..... 23.50
Chalmers 30..... 30.00
Everett 30 tubular..... 14.00

Write for prices on any other makes

AUTOMOBILE APPLIANCE CO.
1436-38 So. Michigan Ave. Chicago, Ill.

PRICE WRECKERS

Our new Price Wrecker (catalogue) just printed quotes dealers' prices on all accessories, motors, transmissions, tops, bodies, windshields, etc. Sent free on request.

A FEW OF OUR BARGAINS

New Herschel-Spillman motors, 4 and 6 cylinder, \$275.00; other motors \$65.00 up. \$300 fore-door touring bodies, new, \$85.00. Runabout bodies—1914 Ford, new, \$35; others \$40 and \$50.00. Runabout tops, \$15.00; touring, \$25.00 (measurement blank sent on request). Racing seats, \$10.00 each. Spicer universal joints, \$4.00 each; mechanical oilers, \$4.00 up; windshields, \$5.00 up; special nickel 1 piece Rainvision shield, \$10.00; Disco self starter, \$5.00; Remy complete dual system magnetos, Model R. L. and R. D., \$25.00; others \$5.00 up; Rayfield, Stromberg and Schebler carburetors, \$5.00 up; gloves, \$1.00 up; Racoon Fur coats (special bargain), \$18.00; double plush robes, \$3.50 each; bulb horns, 75c; electric horns, complete with wire and button, \$1.95; hand horns (mechanical), \$1.50; exhaust horns (all sizes), \$2.50; spark plug pumps, \$5.00; double action pumps, \$1.75.

SPARK PLUGS!

Special, 5 for \$1.00; Mosler, 4 for \$1.00; Timesco, 3 for \$1.00; Bearings, all types, \$1.00 up to \$5.00.

SPRING SHOCK ABSORBERS!

\$12.50 buys the latest in spring shock absorbers, equal to the highest grade on the market selling at \$35.00. Easy to install! On all good cars as regular equipment.

Hartford-Mondex shock absorbers, \$5.00 each; rims, detachable or demountable, \$2.50 and \$3.00 each; all makes and sizes. Storage batteries, \$6.00; tool boxes, \$1.00 and \$2.00; rain coats, \$1.90; rubber "slip-on" shirts, \$2.50; clocks, \$1.00 up; gas tanks, \$2.50; Prest-O-Lite (genuine) tanks, style B, \$12.50 (complete).

LAMPS

Side oil, \$3.00 pair; side electric, \$2.00 pair; tail oil or electric, \$1.15; gas head lights, \$5.00 pair (large); electric headlights, large, \$7.00 pair; Gray & Davis large swivel searchlights, \$9.00 each.

RADIATORS

ALL MAKES at less than one-half price. Buick "10," \$19.75; Buick 16/17, \$36.00; Hudson "20," \$29.00; Hudson "33," \$29.00 new. Many others. Radiators repaired or traded in.

FORD

exhaust horns, \$1.65; electric headlights, \$6.00 pair (Gray & Davis). Special! Ford Holley carburetor, \$3.50. Set of 4 enclosed spring shock absorbers, \$7.50; master vibrators, \$3.25, \$4.00, \$5.50.

Automobiles and trucks, new and used. WAR PRICES. Send for special list and say what type you are interested in.

Times Square Automobile Company

(Largest Dealers in the World)

1210 Michigan Ave. Chicago, Ill.
1743 Broadway New York City

RADIATORS

WHILE THE STOCK LASTS

Name.	Model.	Price.
Brush	All Mod.	\$10.00
E. M. F.	30	15.00
American	30	20.00
American	34	21.00
American	56	22.00
Krit	All Mod.	18.00
Nyberg	4-Cy.	20.00
Nyberg	6-Cy.	22.00
Westcott	6-Cy.	20.00
Stoddard-Dayton	All Mod.	20.00

The M. & M. Company

500 Prospect Ave. Cleveland, Ohio
Do You Want Our Big General Catalogue?
It's Yours for the Asking

RADIATOR — "The Conservator" — Protector (pat. pend.). The only scientifically designed radiator protector on the market. Write for literature. Dealers take note. Made for all cars. Ford special \$1.50.

JOHN J. HUDSON Tarrytown, N. Y.

SACKETT & TRUMBULL

325 E. 21st St., Chicago (2½ blks. E. of Mich. Av.) We buy and sell Automobiles, Batteries, Prest-O-Lite tank, Tires, Tubes, Lamps, etc. We have lots of goods, new and used, on hand. Save money by ordering from us.

TWENTY-FIVE HIGH GRADE COUPE BODIES for quick delivery. Write for prices, blue prints and specifications.

IRVIN ROBBINS & CO.
11th St. and Canal Indianapolis, Ind.

Think—

—what a saving of 25 to 75% on all the Parts, Accessories and Supplies you buy in one year would be. You can save this much and more, dealing with us.

Write for OUR MONEY saving catalogue
A FEW SPECIALS

Tops

A few special bargains in roadster and touring car tops for many cars. Prices: \$10.00, \$15.00 and \$20.00.

Rear Axles

¾ Floating Weston-Mott Axle, complete..\$25.00
Full Floating Sheldon Axle, complete..... 50.00
Full Floating Lewis Axle, complete..... 80.00

Tire Pumps

Motor Driven
Celebrated Simplex Spark Plug Tire Pumps, regular \$15.00 kind, special price.....\$7.50

Electric Starters

A \$75.00 Disco Starter for.....\$14.10

Magnetos and Coils

Four-cylinder Splitdorf Magnetos.....\$10.00
Four-cylinder Remy Magnetos, S and T... 10.00
Four-cylinder Remy Magnetos, R L..... 15.00
Four-cylinder Eisemann, High Tension..... 25.00
Four-cylinder Volta, High Tension..... 15.00
Four-cylinder Bosch, A.R.H., Low Tension 10.00
Four-cylinder Pittsfield..... 10.00
Two-cylinder Heinze Coils..... 6.00
Four-cylinder Briggs Coils, Kick Switch.. 6.00
Four-cylinder Splitdorf Coils, Kick Switch. 8.00
Four-cylinder Bosch Duplex, Kick Switch 9.00
Four-cylinder Splitdorf Tubular Coils..... 7.50
Connecticut Kick Switch, for Magneto and Battery..... 1.50
Deaco Lighting Generators..... 28.50
Deaco Automatic Cut-Outs..... 1.45

Lamps—Lamps—Lamps

9" Gas Head Lamps, per pair.....\$5.00
11" Gas Head Lamps, per pair..... 7.00
9" Electric Head Lamps, per pair..... 6.50
11" Electric Head Lamps, per pair..... 8.50
Electric Tail Lamps..... 1.25
Side Lamps..... 1.50
Oil Tail Lamps..... 1.50

Various

Kingston Carburetors for Fords.....\$ 3.00
Tool Kits..... 1.00
Spark Plugs (6 for \$1.00)..... .19
Oakland and Studebaker Radiators..... 25.00

And many other radiators.
Springs for all cars—at a price.
Tool Boxes, 22x30x10..... 1.25
Studebaker Mahogany Dashes..... .75
Ford and Studebaker Front Floor Mats... .90
Roadster Bodies, complete..... 55.00
Studebaker Bodies, Touring, 7 Passenger.. 60.00
Oakland Touring Body..... 60.00
Abbott-Detroit Seven-Passenger Body.... 55.00
E. M. F. Five-Passenger Bodies..... 60.00
Model B Prest-O-Lite Tanks..... 10.50
Model E Prest-O-Lite Tanks..... 9.00
Oval Gasoline Tanks, 30x15x11..... 3.00
Round Gasoline Tanks, 12x30..... 2.75

DON'T FORGET

We are the Original Repair Parts Factory

We furnish repair parts for over fifty-three models of cars, such as Warren, Elmore, Marquette, Rainier, Welch-Detroit, Welch-Pontiac, F. A. L., Reliable Dayton, Barnes, DeLuxe, Demot, Michigan, Cutting, Northern, Queen, Wayne, Crow, Anhut, Herreshoff, Henderson, and many others. If you want any part for any auto, write us.

Prompt Deliveries

Puritan Machine Co.

ALFRED O. DUNK, Pres.
DETROIT, MICHIGAN

The Clearing House—continued.

RADIATORS

NEW GUARANTEED

	Tubular. Honeycomb.	
Ford T.....	\$17.00	\$19.50
Buick 10.....	19.75	22.50
Hudsons, 20-33.....	29.00	29.00
Overlands.....	31.00	33.00

We have radiators both tubular and honeycomb to fit any car. Write us for prices before buying. Send in your old radiator for repairs. We are experts. We'll make allowances on your old radiator.

WORLD'S LARGEST DEALERS
In automobiles and accessories. Send for the great
PRICE WRECKER

the money saver, covering everything pertaining to an auto.

TIMES SQUARE AUTO CO.
56th and Broadway New York
1210 Michigan Ave. Chicago, Ill.

TO GARAGE AND REPAIR MEN

Motor car owners are demanding that their cylinders be reground and fitted with new pistons and rings. Are you in a position to accommodate them? If not, attach an Acme Cylinder Grinder to your lathe and get this business. There is money in it for you.

We also regrind cylinders and fit them with new pistons and rings. Liberal discounts to you on this work.

Acme Grinder Company
Office, 2225 Harriet Avenue
MINNEAPOLIS, MINN.

We Tear 'Em Up and Sell the Pieces

We can save you money on Repair Parts or Supplies for your Auto.

Can supply you with Crank Cases, Crank Shafts, Cam Shafts, Cylinders, Pistons, Connecting Rods, Radiators, Gears (any style), Timers, Magnetos, Coils, Carburetors, Manifolds, Water Pumps, Transmissions, Rear and Front Axles, Wheels, Steering Gears (complete), Steering Wheels, Gasoline Tanks, Wind Shields, Springs, Bodies, Seats and Cushions, Jacks, Tires and Tubes, Head Lamps, Side Lamps and Tail Lamps (any style), Prest-O-Lite and Search Light Tanks, Horns, Mufflers—in fact, any part of an auto.

We also buy old autos—condition no object—or any part of an auto, or if you want to trade parts we will trade with you.

OUR GUARANTEE TO ALL—IF NOT SATISFIED WITH YOUR BARGAIN, RETURN AND WE WILL REFUND YOUR MONEY.

SPECIAL BARGAINS

New Ford Wheels, 30x3.....	\$ 2.00
Rain Vision Wind Shields, brass finish....	10.00
Electric Horns with cord and push button	2.50
Umpf Timer, 2 and 4 cyl., new.....	2.00
Splittorf Magnetos.....	15.00
Mercedes Type Radiators.....	12.50
Electric Tail Lamps.....	1.25
Comb. Trunk and Tire Holder.....	1.50

Send for Our Motor List

AUTO WRECKING CO.
Old Church, 13th and Oak
KANSAS CITY, MO.

We Make Ford Racing Type Bodies
In several models for immediate delivery
AUTO SHEET METAL WORKS
1532 Michigan Ave. Chicago, Ill.

Where the Enamel Finish Is Dull Cracked or Chipped

use Peerless Extra Fine Black Japan for all around work on wood or metal. Air drying over night. Ask your dealer.

THE COLUMBUS VARNISH COMPANY
Columbus, Ohio

YOU CAN CHANGE YOUR CAR
into raceabout yourself. We furnish radiators, hoods, seats, tanks and fenders. Get our prices.
AUTO SHEET METAL WORKS
1532 S. Michigan Ave. Chicago, Ill.

\$5.00 HOOD COVERS FOR FORDS \$2.50 DELIVERED

Detroit's Oldest Department Store offers an exceptional bargain in Hood and Radiator Covers for Ford Cars. Made of very best material, heavy thick quilting. We will send one prepaid for \$2.50, and if it is not the equal of any \$5.00 cover, you may return it at our expense. Dealers, send \$2.50 for sample, then get our dozen proposition.

Heyns Bazaar Detroit, Mich.

\$50
Best at Any Price
THE ADMIRAL WELDING EQUIPMENT
"Built by Men Who Know"
with decarbonizer and welding supplies, fully equips you to handle any job. Our complete instruction book tells you how. You can't buy a better outfit. Write for illustrated booklet.
ADMIRAL WELDING MACH. CO.
1327 Walnut Street Kansas City, Mo.

\$600 TAKES 1913 \$2,500 KIMBALL LIMOUSINE
Body taken from 1913 Locomobile; no trade; no terms.
MR. M. MERGENDOLLAR
Hotel Haynes, Chicago, Ill.

PARTS AND ACCESSORIES WANTED

WILL PURCHASE SPOT CASH
Spark Plugs or other Ford Specialties
Job Lots Desired
GEORGIA AUTO SUPPLY CO.
Athens, Georgia

PATENTS & PATENT ATTORNEYS

C. L. Parker, Patent Attorney
Formerly member Examining Corps, U. S. Patent Office, 960 G St., Washington, D. C. Pamphlet of instruction sent upon request.

PROTECT YOUR IDEAS
Send for free book and free search plan.
MILO B. STEVENS & CO.
53 W. Jackson Blvd., Chicago
Established 1864 Main office, Washington

RADIATOR AND LAMP REPAIRING

A. A. A. Radiators Manufactured
Any make repaired and returned same day. Radiators to fit any car shipped in three days. New cores replaced in any make radiator. All work fully guaranteed. **SHEPPARD CO., 1331 W. Jackson Blvd., Chicago, Ill.**

ALL KINDS OF AUTO RADIATORS, HOODS, fenders, lamps, windshields, etc., rebuilt and repaired. All work guaranteed. Phone or mail order. Telephone Calumet 4583.
L. BLUMENFELD & CO.
1919 Wabash Ave., Chicago

ALL OUR RADIATOR REPAIRING GUARANTEED. New Radiators, Hoods, Fenders, Tanks and New Cores installed in old radiators at bargain prices.
ILLINOIS AUTO SHEET METAL WORKS
58-60 E. 16th St. Chicago, Ill.

AMERICAN AUTO SHEET METAL WORKS
We are masters of the trade. Manufacturers of Radiators, Hoods, Fenders, Gas Tanks, etc. Repairing a specialty.
1446 Wabash Ave., Chicago, Ill.

ANY MAKE OF RADIATOR MANUFACTURED or repaired. One day required for repairs; two days for a new radiator. Hoods, fenders, gasoline tanks, lamps, etc.
WABASH AUTO RADIATOR MFG. CO.
1137 S. Wabash Ave. Chicago, Ill.

ARROW RADIATOR REPAIR CO.
1331 Wabash Ave., Chicago, Ill.
Expert repair work on Radiators, Hoods, Fenders, Dashes, Tanks and Drip Pans.
We guarantee all our work
Phone Calumet 1995

CHICAGO MFG. CO.
1466 Michigan Avenue, Chicago
We are the only radiator manufacturers in Chicago making a square tube radiator. New guaranteed cores placed in old radiators. We also manufacture Hoods, Fenders, Tanks and Pans and do guaranteed repair work. Prompt service.

DULUTH AUTO RADIATOR AND LAMP REPAIR WORKS
We repair burnt, frozen and wrecked radiators; also auto fenders; hoods and tanks made to order. Shipments promptly taken care of.
336 E. Superior Street Duluth, Minn.

M. & L. Auto Sheet Metal Works
Rebuild and repair radiators, hoods, fenders, tanks, lamps, etc. Telephone Calumet 2348.
1551 Michigan Ave., Chicago, Ill.

ONLY RADIATOR FACTORY IN NORTHWEST

Pioneer manufacturer. Why send your radiator down east when you can ship it to us; save time, express, freight, money, and get best workmanship. Prices right. Make new radiators, allow for old one.

TODD MANUFACTURING CO.
820-824 Mary Pl. Minneapolis, Minn.

REBUILDING AND REPAIRING

A. A. A. SCORED CYLINDERS

We fill your deep scored cylinders with a silver composition by our patented electric filling process. Remember! We also do a large welding business.

L. LAWRENCE & CO.
Newark, N. J.

ANDRE G. CATELAIN
Everready Automatic Engine Starter. General machine work for foreign and American cars. Welding of all metals. Manufacturer Catelain Hose Coupling.
1446-8 Indiana Avenue Chicago, Ill.

CYLINDER GRINDING

on automatic machinery by skilled mechanic at prices that will interest you. Gears, axles, valves and parts of all kinds made of high grade alloy steel. Send us your worn or broken parts and we will replace them. Oxy-Acetylene welding of cracked cylinders a specialty.

ADAPT MACHINERY CO.
1624 So. Wabash Ave. Chicago, Ill.

CYLINDER REBORED
Including piston and rings.....\$7 to \$11
STERLING ENGINE CO.
331 So. Clinton Street Chicago, Ill.

The Clearing House—continued.

CYLINDERS REBORED AND REGROUND

Fitted with my light pistons and leakless rings.

Watch this space for the most startling announcement, my latest invention in a light PISTON.

THE LEAKLESS PISTON RING FACTORY

McCADDEN MACHINE WORKS
ST. CLOUD, MINN

CYLINDERS REBORED

Pistons and Tight Rings Furnished. General overhauling, crankshafts manufactured. Quality guaranteed. Prices interesting.

HOPE MACHINE CO.

2310 N. Second St. Philadelphia, Pa.

CYLINDERS REGROUND

and fitted with new pistons and rings for \$7 to \$11 per cylinder. We do this class of work exclusively and are thus able to give you the highest class of work at these prices. Oxy-acetylene welding done at reasonable prices

CROWN MACHINE SHOP

Crown Point, Ind.

CYLINDERS REGROUND

PRICES \$5.00 TO \$10.00 PER CYLINDER

OHIO GRINDING WORKS

34 S. St. Clair St. Dayton, Ohio

CYLINDERS REGROUND

Furnished with new pistons and rings, from \$7.00 to \$11.00 per cylinder.

GEO. I. TRUMP MACHINE SHOP

Crown Point, Ind.

WE REGRIND CYLINDERS

Furnish our heat treated piston rings and pistons. First-class equipment, 15 years' experience. Write for our prices.

BRIDGEPORT PISTON RING CO.

Bridgeport, Conn.

SCHOOLS

FREE BOOKLET

"How to Succeed in the Automobile Business," on application. A Greer diploma guarantees efficiency. Largest motor college in the world—1,400 graduates—\$40,000 in modern equipment—eight instructors—actual work, repairing and driving—Day and evening classes—many owners and dealers employ Greer graduates only.

GREER COLLEGE OF MOTORING

Chicago's "Safety First" Automobile School
1456 Wabash Ave. Chicago

THE AUTOMOBILE BUSINESS

offers wonderful opportunities. We are placing men from all parts of the country in good paying positions. Send for Booklet "M."

STEWART AUTO SCHOOL

Chartered by N. Y. State Board of Regents
225 W. 57th Street, New York City

WE FURNISH POSITIONS

After we teach you the principle and construction of all cars; how to remedy all troubles and how to make all repairs.

LEITZE AUTOMOBILE TRAINING SCHOOL

"The School that Graduates Experts"

347 Franklin St. Buffalo, N. Y.

STORAGE AND SHIPPING

P. BRADY & SON CO.

Trucking and Storage. Automobiles and Bodies Stored. Automobiles boxed for Export.
552-558 W. 58th Street, New York
Telephone 3440 Columbus

TIRES

AUTO TIRES—USED SLIGHTLY

300 34x4 tires, Q. D. Bought of manufacturer who used larger sizes for next year—\$8 each. Tubes \$2. Save \$ \$, one-third with order.
BENEDICT, 63 Winder St., Detroit, Mich.

BARGAINS—TIRES—BARGAINS

In Guaranteed, Seconds and Used Tires

Write for our prices
ACME TIRE REPAIR COMPANY
1547 Michigan Ave. Chicago, Ill.

BIG CUT IN PRICES ON TIRES

New, fresh stock.

Our price list will interest you.

SERLIN TIRE CO.
1073 W. 14th Pl., Chicago, Ill. Phone Canal 2191.

TIRE DEALERS—Send for our tire proposition. We have a tire that will make YOU independent of seconds for low priced tires. Send Today—NOW!

PEERLESS TIRE CO., INC.
304 West 54th St. New York, N. Y.

Make Two Old Tires

do the work of a new one. Send us two of your old casings, regardless of their condition; by our process we return you the two tires made into one ready for 2000 miles of actual service. We guarantee this mileage absolutely. We are doing it for others. Send us two old tires today, or write and ASK US HOW.

COWANS BROS.

150 W. 55th St. New York City

READ THIS TIRE GUARANTEE

3500 Miles—Or a New Tire Free

The only tire you can buy with a positive bona fide guarantee of 3,500 miles' service or another tire ABSOLUTELY FREE. Read this:

We guarantee this tire, No. —, Size —, to give you 3,500 miles of actual service. If for ANY reason you do not receive 3,500 miles of actual wear we agree to give you another tire fresh from our stock ABSOLUTELY FREE and make no charge for mileage already obtained.

30x3	...\$10.95	33x4	...\$20.75	35x4 1/2	...\$27.90
30x3 1/2	...14.70	34x4	...21.50	36x4 1/2	...28.85
32x3 1/2	...15.65	35x4	...22.50	37x5	...34.25

Write for complete price list. 5% discount for cash with order. Order today direct from

CONSUMERS TIRE COMPANY

817 Hume Mansur Indianapolis, Ind.

TIRES!—Extra heavy type tires. They average 5,000 miles' service. 30x3, \$6.75, tube, \$2.25; 30x3 1/2, \$8.50-\$2.75; 32x3 1/2, \$8.00-\$3.00; 33x4, \$12.40-\$3.60; 34x4, \$12.50-\$3.75; 36x4, \$13.75-\$4.00. All other sizes. Skids, 10% additional.

TIRE SALES COMPANY Buffalo, N. Y.

WANTED—AGENTS & SALESMEN

MAKE \$2.00 ON EACH \$5.00 SALE

Every automobile owner buys. Glareless glass just accepted by Chicago authorities. Beats everything. Motor Autolite, 404 First National Bank Building, Chicago.

WANTED—Salesmen at Liberal Commission to sell Ford Auto-Starter. County Agencies in any State west of the Mississippi River. The best mechanical starter ever invented.

THE BUCKEYE AUTO STARTER CO.
57 Main St. Deshler, Ohio

AGENTS WANTED

To solicit Nickel Plating of Automobiles, etc. Big commissions.

Nelson Plating Co. Morris, Ill.

WELDING

A. A. A. WELDING EXPERTS

Broken crankshaft, crank pins, cylinders, flywheels, gear teeth, pistons, perfectly welded and machined, ready to replace; scored cylinders made new; booklet. Atlas Welding Company, 44 Elizabeth Ave., Rahway, N. J.

AA1 WELDING OF ALL METALS

Cast Iron and Aluminum a Specialty.
ADVANCE WELDING MACHINE COMPANY
525 W. Jackson Blvd. 111 N. Desplaines St.
Phones: Monroe 3937; Auto. 36-192. Chicago, Ill.

Absolutely Guaranteed Welding

We absolutely guarantee all work done by the OXWELD PROCESS of welding and cutting, including welding cracked or defective cylinders, crankshafts, housings, aluminum crank and transmission cases, etc., etc. Estimates furnished on job and contract welding and cutting of all kinds.

OXWELD ACETYLENE COMPANY

36th St. and Jasper Pl., Chicago, Ill.

OXY-ACETYLENE WELDING

Broken automobile crankshaft, aluminum cases, cracked cylinders and general machinery parts successfully welded by us. Estimates cheerfully given. Satisfaction guaranteed.

PIONEER WELDING CO.
610 E. Main Street Kalamazoo, Mich.

AUTOGENOUS WELDING

Expert welders on automobile parts. Manufacturer of the Galbraith Welding Torches.

C. SORESENSEN
18 E. Sixteenth St. Chicago

WELDING

Cylinder, crankcase and crankshaft welded. Cylinders rebored, \$7 to \$11 a cylinder, including pistons and rings.

STERLING ENGINE COMPANY
331-333 S. Clinton Street Chicago, Ill.

MISCELLANEOUS

WANTED—APPLICATIONS

Experimental Engineers, Automobile Work, Designers on Gasoline Engines, Foreman Automobile Assembly, Electric Garage Men.

The Toledo Engineering Agency, Toledo, Ohio

WANTED—Names of FORD OWNERS. We pay \$5.00 per 100. Send 25 cents for contract blanks, particulars, instructions and outfit.

UNIVERSAL SYNDICATE

1123 13th Avenue Moline, Ill.

The Big Show Numbers of MOTOR AGE

will have an enormous circulation among the automobile public.

No increase in advertising rates for the excess circulation of these issues.

Here's an opportunity that comes but once a year—look around and see what you would like to dispose of and send us copy for the Clearing House columns of the Motor Car Industry—note advertisements in preceding pages.

For further particulars address

MOTOR AGE

910 S. Michigan Ave. Chicago

Classified Advertising

Rate 25¢ a Line

Cars For Sale

A REAL BARGAIN—ABSOLUTELY NEW
Chalmers "Master Six," seven-passenger car, fully equipped, just as it leaves the factory, and has never been run a mile. I need the money, hence this price, \$1,950.00. H. P. Allen, Box 76, Fort Wayne, Ind.

FOR SALE—MODEL "E" FRANKLIN ENGINE, 3¼x3¼ and transmission complete. Also steering gear, axles, wheels with new tires. All in first-class condition, at a bargain. For particulars write F. L. Broker, 1504 Marquette Ave., Minneapolis, Minn.

KOEHLER TRUCK, 1,600 POUNDS CAPACITY, brand new, 24 h. p. motor, solid tires, Bosch magneto; bargain at \$650. Maloney, 15 East Ninth street, St. Paul.

4 PASS, ELECTRIC COUPE, CASH, TIME, trade for gas coupe. 3252 Kenwood, Ind'p'l's.

Parts and Accessories WANTED

WANTED—A THOMAS SURREY (TORPEDO) Body, 1912 style, upholstered, second hand, cheap. Give description. Lock P. O. Box 822, Greenport, L. I., N. Y.

Help Wanted

WANTED—AUTOMOBILE MAN FOR FAR
East as traveling representative for large American automobile manufacturer. Machines are standard, well known, heavily advertised and our output and sales are very large. The man we require must be a salesman of proven ability, a thorough automobile man and must be familiar with the foreign territory indicated and with its trade conditions and customs. A big opportunity for a man big enough to measure up to it. Address, with full details, Box E, 255 c/o Motor Age.

WANTED—CHAUFFEUR TO DRIVE SIMPLEX and Mercer cars; married man over 30 years preferred; must be expert mechanic and driver, willing to wear uniform; neat in appearance and used to late hours, if necessary. A thorough knowledge of Chicago and vicinity. Good references and temperate habits required. Apply Box 257, Yale Station, New Haven, Conn.

WANTED—LIVE SALES MANAGER to sell production of pleasure car manufacturer making limited number cars. Must have wide acquaintance and best of references and expect reasonable salary only. Write, giving full particulars, to Box E 254, c/o Motor Age.

Situations Wanted

AUTOMOBILE MECHANIC AND MACHINIST, expert in vulcanizing; several years' experience; best of references. R. No. 1, Box 47, Genoa Junction, Wis.

ENERGETIC, AGGRESSIVE YOUNG MAN of 22 wishes position in office, store or any place having a future. Experienced in collections, timekeeping, billing, advertising, purchasing, insurance, and retail work. Will start in with low salary. A-1 references. H. S. Hartzman, 1123 13th Ave., Moline, Ill.

TEMPERATE AND RELIABLE AUTOMOBILE, vehicle, pictorial and machinery painter, striper and letterer would like position. Can manage and estimate work. Address Box E 246, c/o Motor Age.

WANTED—A POSITION BY A FIRST-CLASS mechanic capable of taking charge of repair department or service station. R. H. Hill, 1406 Glendale Ave., Peoria, Ill.

YOUNG MAN THOROUGHLY FAMILIAR with handling, care and driving of Buick cars, would like position with Buick agency and repair shop; steady and reliable. Address Box E 241, care Motor Age.

ENGINEER SUCCESSFUL IN DESIGNING motor trucks of all capacities and light pleasure cars is open for engagement. Ten years' experience. At present connected with prominent company. Box E 249, c/o Motor Age.

Business Opportunities

PROFESSIONAL A. A. A. RACING DRIVER wishes independent financial backer for 1915 season. Write for proposition. Address Driver, 305 Court St., Saginaw, Mich.

Garages, Shops, Etc., FOR SALE

A BUSINESS OPPORTUNITY—A COMPLETE auto tire repair plant for sale. The largest and most up-to-date plant in this section. For further information write Box E-233, care of Motor Age.

Read
MOTOR
AGE



Greenslade Oil Co.
Main Office, Detroit, Mich.

Pacific Coast Agency
Geo. L. and J. A. McPherson
Portland, Oregon

Hoyt Electrical Instrument Works

Makers of

HOYT AMMETERS AND VOLTMETERS

Penacook, New Hampshire

The PARISH & BINGHAM COMPANY
PRESSED STEEL **FRAMES**

Write for Estimates

CLEVELAND, OHIO

SPARK PLUG BARGAINS

Dealers: Boost your profits these dull times by buying good, guaranteed Spark Plugs at low prices—Spark Plugs that you can sell for \$1.00 each and make 5 times your cost:

Special High Grade Porcelain Plugs, dozen.....	\$2.00
Special Ford Regular Plugs, dozen.....	2.40
Special Long Ford Plugs, dozen.....	2.40
Special Priming Plugs, dozen.....	7.00

Send us a trial order for the above. Every Spark Plug FULLY GUARANTEED. Money back if not satisfactory.

Service Motor Supply Co., 640 Washington Blvd., Chicago, Ill.

DEALERS ATTENTION

Send for our 1915 Advance Supplement and get your name on our list for 1915 complete catalogue. Will be ready about April 1st.

CHICAGO AUTOMOBILE SUPPLY HOUSE
1355 Michigan Blvd. Chicago, Ill.

BEST BUSINESS OPENING IN ENTIRE

Northwest for immediate investment. Absolutely satisfactory reasons for selling given. Investment of from about ten thousand to fifteen thousand maximum will amply finance proposition. Ten thousand dollars conservative estimate net profits in next ten months. North Dakota will be best field in United States for automobile sales next season account war prices for all grains and stock. Business thoroughly established. Splendid little city of six thousand with white way, clean and up to date. Post office building cost one hundred fifty thousand. Capital of lake region. Large territory on Cadillac available. Also agency still open for two best selling cheap cars on American market. Established supply business pays all expenses. Rare and exceptional opportunity for energetic young man with reasonable backing. Part of financing can probably be arranged locally. Reply promptly to "Lake Region," c/o Motor Age.

FOR RENT—GARAGE FOR RENT IN THE prosperous town of Galva, Ill. Address reply to W. F. Nott, Galva, Ill.

FOR SALE AT A BARGAIN—GARAGE with full equipment, including Bowser pump machinery, oil tanks, vulcanizer, Prest-O and Searchlight service. Located on Lincoln Highway where hundreds of tourists pass every day. Building can be leased for 5 years. Average gas sales 1,500 gal. per week. A bargain at \$2,500. Address Box E 170, c/o Motor Age.

FOR SALE—LARGE RETAIL AND WHOLESALE motor car and supply business, three fine contracts, good territory. Supply contracts and car contracts on jobbing basis best location in city of 250,000. Other business only reason for selling. Will retain interest with high class man. About \$15,000 required. Best opportunity open today. Address Box E 253, The Motor Age.

FOR SALE—VULCANIZING PLANT IN SO. California town, doing good business. Finest climate on earth. Ideal for health seeker. Address for particulars, A. H. May, 1318 Fifth St., San Diego, Cal.

FOR RENT OR SALE—THE FINEST AND best equipped garage and machine shop in southern Iowa; fine place for auto distributing business. S. G. Hunter, Albia, Iowa.

GARAGE AND GOOD BUSINESS FOR sale. Building 50x100; basement 32x50; steam heat; price right, if sold soon. Iowa Auto Company, Keota, Ia.



STEER WARMES

**Insure Warm
Hands and Comfort
on the Coldest of Winter Days**

STEER WARMS consist of two electrically heated, leather covered grips that lace on the steering wheel. They keep your fingers and hands from becoming chilled on the rawest day—and that means you are warm all over.

They take only a minute to attach. Lace on; wire up. That's all. No marring the wheel. No holes to bore. A switch conveniently located regulates the heat. The current is taken from the battery, electric lighting system or magneto. Very little current required. Steer Warsms guaranteed to give satisfaction and not to burn out within five years.

PRICE: \$7.50 per pair complete, ready to attach to any car. Special STEER WARMS for Ford cars, \$5.00.

The IECO Electric Manifold Plug combines three separate devices into one. First, it is a primer and from the dash you can prime your car without raising the hood. Second, it is an electric vaporizer, which enables you to start your car almost instantly on the coldest winter day. Third, it is a gasoline saver when used as an auxiliary air valve, saving at least 20% to 30% of your gasoline expense.

Material and workmanship are fully guaranteed. Booklet upon request.

DEALERS: Car owners everywhere want STEER WARMS and MANIFOLD PLUGS. Get your share of this business. We back you up with our positive guarantee. Write for our discounts.

INTERSTATE ELECTRIC COMPANY
362 Baronne St., New Orleans, La.



Republic Motor Trucks

**The Easiest Selling Line of Motor
Trucks in America**

3/4-ton with express body, internal gear
drive\$ 995.00
1-ton chassis..... 1350.00
1 1/2-ton chassis..... 1475.00

The Vitals of the Republic 1 AND 1 1/2-TON MODELS

Continental Motor	Russell Full Floating
Timken Axles	Jack Shaft
Bosch Magneto	Covert Transmission
Stromberg Carburetor	Standard Cone Clutch
	Firestone Tires

No Better Units Built

We ask the opportunity to prove our statements.
Wire or write for catalog and complete information.

Republic Motor Truck Co., Alma, Mich.
(FORMERLY ALMA MOTOR TRUCK CO.)

Index to the

Argo Motor Company.....76-77
Atwater Kent Manufacturing Works..... 93
Auto Parts Company..... 88 & 94
Automobile Trade Directory.....66-67

Bailey Auto Heater Company..... 103
Bosch Magneto Company..... 2
Boston Starter..... 92
Braender Rubber and Tire Company..... 92
Bricton Manufacturing Company..... 94
Bridgeport Brass Company..... 94
Briggs-Detroit Company..... 90
Briscoe Motor Company.....Cover
Brown Company..... 90

Chicago Automobile Supply House..... 101
Classified..... 100
Clearing House..... 95 to 100
Connecticut Telephone and Electric Company 91
Continental Motor Manufacturing Company.. 65
Corcoran Lamp Company..... 91
Cox Brass Manufacturing Company..... 1
Cullman Wheel Company..... 94

Dayton Rubber Manufacturing Company.... 89
Dodge Brothers..... 68
Dover Stamping and Manufacturing Company 103
Dyneto Electric Company..... 93

Eisemann Magneto Company..... 81
Electric Auto-Lite Company..... 83
Elkhart Carriage & Harness Mfg. Co..... 79

Fedders Manufacturing Company..... 89
Firestone Tire and Rubber Company..... 90
Fisher Electrical Works..... 94
Ford Motor Company..... 88
Fort Wayne Engineering & Manufacturing Co. 84
Fulton Company..... 91

Gabriel Horn Manufacturing Company..... 85
Garford Manufacturing Company..... 91
Goodrich, B. F., Company..... 90
Gramm-Bernstein Company..... 93
Greenslade Oil Company..... 101
Grossman, Emil, Manufacturing Co., Inc.... 91

Heinze Electric Company..... 92
Herz and Company..... 86
Holley Brothers Company..... 88
Hoover, W. H., Company..... 89
Houk, George W., Company..... 92
Hoyt Electrical Instrument Works..... 101
Hyatt Roller Bearing Company..... 90

Interstate Electric Company..... 102
Inter-State Motor Company..... 88

Jackson Automobile Company..... 48a

K. W. Ignition Company..... 85
Kemco Electric Manufacturing Company..... 82
Kimball Tire Case Company..... 88
Kissel Motor Car Company..... 89
Koehler, H. J., S. G. Company..... 87
Kokomo Electric Company..... 90

Advertisements

Leece-Neville Company..... 88
Lexington-Howard Company..... 94

Manzel Brothers Company..... Cover
Martinique Hotel..... 82
Master Carburetor Corporation..... 89
Maxwell Motor Company..... 49 to 64
Metz Company..... 91
Moon Motor Car Company..... 45
Motometer Company..... 87

National Automobile Chamber of Commerce.. 48
National Motor Vehicle Company..... 84
New Departure Manufacturing Company... 69 to 72
New York and New Jersey Lubricant Company 94
Nordyke and Marmon Company..... 89
Northwestern Chemical Company..... 94

Osgood Auto-Lite Company..... 94

Paige-Detroit Motor Car Company..... 92
Parish and Bingham Company..... 101
Pennsylvania Rubber Company..... 88
Perkins-Campbell Company..... 93
Prest-O-Lite Company..... 93

Rajah Auto Supply Company..... 93
Regal Motor Car Company..... 46
Remy Electric Company..... Back Cover
Reo Motor Car Company..... 74-75
Republic Motor Truck Company..... 102
Republic Rubber Company..... 86
Robbins, Irvin, Company..... 87
Royal Equipment Company..... 92
Rutenber Motor Company..... 93

Salisbury Wheel and Manufacturing Company.. 92
Schrader's, A., Son, Incorporated..... 82
Scripps-Booth Company..... 73
Searchlight Company..... 89
Service Motor Supply Company..... 101
Shaler, C. A., Company..... 91
Sparks-Withington Company..... 88
Specialty Sales Company..... 86
Sphinx Motor Car Company..... 90
Splitdorf Electric Company..... 4
Standard Oil Company..... 78
Star Ball Retainer Company..... 90
Stearns, F. B., Company..... 104
Stewart-Warner Speedometer Corporation... 43
Stromberg Motor Devices Company..... 92
Sulzberger & Sons Co..... 3

Twitchell Gauge Company..... 94

Vulcan Car Company..... 89

Westinghouse Electric & Manufacturing Co.. 80
Weston Electrical Instrument Company..... 86
Wheeler and Schebler..... 44
Willard Storage Battery Company..... 47
Winton Motor Car Company..... 91

Xcel-O-Lyte Company..... 87

Zenith Carburetor Company..... 93

Pat. applied for.



ELECTRIC
LIGHT

BULB
CASE

ONE OF THE MANY GOOD THINGS IN THE
LINE OF

Dover Auto Specialties

is the
New Dover Electric Light Bulb Case

It will carry extra bulbs safer than the ones in the lamps of the car. Made of extra heavy seamless steel—all other parts Electric Welded. No rivets or solder used in the construction.

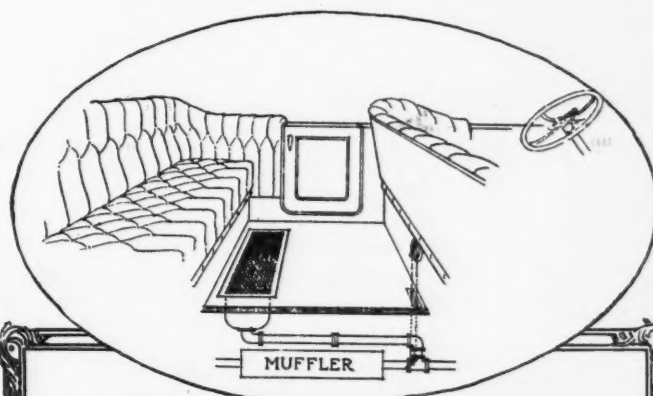
The bulbs are securely held in place by a new brass spring locking device, which gives absolute protection against rough handling and vibration.

A new bulb always ready in perfect condition when needed.

Do not confuse our heavy seamless steel case with the cheap pasteboard or wood boxes, which are quickly ruined by moisture or rough handling and are only fit for keeping bulbs on the shelf in a store.

Send for New Catalog of Over 235 Dover Auto Specialties

DOVER STAMPING & MFG. COMPANY
CAMBRIDGE, MASS.



HEAT YOUR CAR!

Use your exhaust to heat your car. Be comfortable in coldest weather. Install a

BAILEY AUTO HEATER

It costs nothing to operate—utilizes the waste heat of the exhaust gases. Designed for both open and closed cars. Keeps the closed car warm, but not "stuffy". Absolutely odorless and noiseless. Radiates heat in less than 5 minutes. Reduces back pressure. Increases horse power. Can be installed in 30 minutes. Full instructions for installation with each heater. In ordering give outside measurement of exhaust pipe, and car model and make.

PRICE, COMPLETE, \$20.00
LIVE DEALERS ANSWER

BAILEY AUTO HEATER COMPANY
228-232 W. Croton Ave. New Castle, Pa.



Said a Prominent New Yorker:

"I have owned two Stearns cars since 1909. Both have had continuous hard service since date of purchase. I want to buy a new car, but these I have on hand won't wear out. What do you put into the Stearns construction besides good materials that causes them to stand-up so wonderfully?"

The answer is: **BRAINS.**

Do you know of companies in the automobile industry that allow most of their brains to escape thru the selling department?

Well, Mr. Carowner, we believe that in the long run the purchaser of high quality cars appreciates the brain effort that is expended in the designing and manufacturing department of the Stearns company.

Since 1909 there have been important developments, both in brains and in materials, with the result that the Stearns-Knight is the most completely refined and best high quality car purchase in this country.

Support of the foregoing statement is supplied by many hundreds of enthusiastic Stearns-Knight owners. Our catalog will be of interest and we shall be glad to send it upon receipt of your request. Stearns-Knight models in various sizes. Prices upward from \$1750.

THE F. B. STEARNS CO.

Euclid and Lakeview Aves. and Belt Line R. R.

∴ ∴ ∴ CLEVELAND ∴ ∴ ∴

A REAL QUALITY POWER DRIVEN TIRE PUMP

FOR

\$ 20.00

—AND WHAT'S MORE IT'S THE

MANZEL
ENGINE DRIVEN TIRE PUMP
MANZEL

Greater distribution and consequently greater output have enabled us to offer to the automobile public the Manzel two-cylinder Engine Driven Tire Pump, which formerly sold from \$28 to \$30, for \$20.

Remember, in considering this price reduction, that it is accompanied by a quality increase, rather than a quality reduction. In other words the Manzel two-cylinder Engine Driven Tire Pump at \$20 is even a better pump than our former product at \$28 and \$30. This is but natural, as a result of our manufacturing developments and the increase of our manufacturing facilities.

Here is a pump that operates with smoothness and perfect balance, as the cylinders are opposed—a pump which, in point of design, workmanship and materials is not equalled by any other—and, yet, a pump which sells for only \$20 complete with all fittings ready to install.

Go to your dealer for a Manzel pump. If he will not supply you, write us direct.

We carry in stock Fittings for the following cars:

Abbott-Detroit, Buick, Cadillac, Cartecar, Case, Chandler Six, Chalmers 36, Cole, E. M. F., Franklin, Hudson, Imperial Six, Kissel Kar, Maxwell, Michigan, Mitchell, Oakland, Oldsmobile, Overland, Packard, Paige-Detroit, Rambler Cross Country, Reo, Simplex, Speedwell, Studebaker, Stutz, Velle.

Manzel Bros. Company
306 Babcock Street, Buffalo, N. Y.





ELECTRICAL
WONDERS

ELECTRICAL
WONDERS *for*
MOTOR CARS are made by

REMY

STARTING LIGHTING IGNITION